NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

PROCESS IMPROVEMENT TO THE INSPECTION READINESS PLAN IN CHEMICAL WEAPONS CONVENTION CHALLENGE INSPECTIONS

by

William M. Triplett

September 1997

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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188
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1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE September 1997	3. REPORT TYPE AND DATES COVERED Master's Thesis	
4. TITLE AND SUBTITLE TITLE OF THESIS Process Improvement to the Inspection Readiness Plan in Chemical Weapons Convention Challenge Inspections			5. FUNDING NUMBERS
6. AUTHOR(S) Triplett, William, M.			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES),			10. SPONSORING/MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.			
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited			12b. DISTRIBUTION CODE

13. ABSTRACT *(maximum 200 words)*

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This thesis begins with a review of the CWC Challenge Inspection timeline. It then describes the Navy's Inspection Readiness Plan for CWC Challenge Inspections as well as the Navy Tiger Team that is sent to naval facilities to assist the Commanding Officer and base personnel during inspections. One of the initiatives evaluated by this analysis is the use of videoconferencing. To ascertain the feasibility of using videoconferencing in the CWC Challenge Inspection process, this thesis reviews the current videoconferencing systems and standards, and the results of a questionnaire that was sent to various naval commands. This thesis concludes with recommendations for inclusion of videoconferencing and various other Information Technology initiatives in the CWC Challenge Inspection process.

14. SUBJECT TERMS CWC Challenge Inspection, Chemical Warfare Convention, Videoconferencing, Video Teleconferencing, VTC			15. NUMBER OF PAGES 95
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std 239-18 298-102

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
September 1997

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This thesis identified current Information Technology initiatives to help improve the Navy's Inspection Readiness Plan for Chemical Warfare Convention (CWC) Challenge Inspection. The CWC is an intrusive inspection. The Challenge Inspection allows for a team of international inspectors to inspect a naval facility suspected of violating the CWC on very short notice

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ACKNOWLEDGMENT

There are several people whom I would like to thank for their extraordinary willingness to assist me in my research for this thesis. I first want to acknowledge the Navy International Programs Office (IPO-5) for their support and assistance. I would also like to thank my Thesis Advisor, Dr. James J. Wirtz for all of his generosity, support, guidance, and assistance. Additionally, I would like to thank Dr. William J. Haga for all of his help in preparing the questionnaire and being an excellent Associate Advisor. Finally, I reserve my biggest thanks to my wife Linda whose support and patience through this experience are so very much appreciated.

I. INTRODUCTION

A. OVERVIEW

The United States Senate ratified the Chemical Weapons Convention (CWC) on April 24, 1997. It went into effect on April 29, 1997. The CWC is an intrusive treaty. The signatories of the treaty wanted to ensure that the world would never again experience chemical warfare. They also wanted to be able to verify any infraction or assuage concerns about the presence of chemical weapons through an internationally recognized body whose sole responsibility would be to investigate treaty violations. As such, Benoit Morel and Kyle Olson in their book *Shadows and Substance: The Chemical Weapons Convention*, state that the treaty was designed to insure that signatories will not

> produce, stockpile, use or transfer chemical weapons; they will agree to internationally supervised destruction of existing stockpiles of chemical weapons; and they will support and participate in complex verification and compliance mechanisms [Morel and Olson, 1993, p.1].

Compliance with the CWC will be monitored by a verification regime that will include both declarations and on-site inspections. Declarations are required for all current Chemical Warfare (CW) production facilities and those producing CW since 1 January 1946. An international inspection team assigned by the Organization for the Prohibition of Chemical Weapons (OPCW), the administrative and verification organization established under the treaty, will conduct on-site inspections.

The CWC inspection regime includes Systematic Inspections, Facility Inspections, and Challenge Inspections. Each of these inspections serves its own unique purpose. The Systematic Inspections are on-site inspections of some declared facilities using permanent

inspectors, installed instrumentation monitoring or some combination of both. The Facility Inspections are short-notice, on-site inspection aimed at verifying the compliance of the chemical industry to the convention. Finally, the Challenge Inspections are short-notice intrusive, on-site inspections that may occur anywhere. Any facility (even a chemically unrelated one) may be subject to a challenge inspection. Under the challenge inspection regime, the challenged state does not have the right to refuse the inspection. [IPO-5, 1997, p.2]

Of the three types of inspections, challenge inspections are the most intrusive. There are several important considerations that will shape the CWC challenge inspection regime for undeclared facilities. First, the arrival of inspectors at either the requested or an alternative perimeter of the challenged site within 48 hours of the specification of the site can cause some difficulties because neither the precise requested inspection location nor the "requested perimeter" is specified until after the inspection team arrives at the Point-of-Entry (POE). This can leave the base with less than 36 hours of notification. Second, upon arrival at the base, the inspection team has the right immediately to take air, soil, wipe or effluent samples at the inspection perimeter. Additionally, they have the right to monitor and inspect vehicular traffic exiting from the requested perimeter, including ships and aircraft. Third, this is a verification protocol that allows intrusive access to the facility. Unlike other treaties, CWC challenge inspections are not necessarily keyed to physically large items that would preclude inspection of a particular building or location. Additionally, the CWC does not address inspectability of a structure based on the physical dimensions of an item. Fourth, the CWC includes provisions for negotiating verification activity at a site, including access to facility records for review, access to personnel for

interviews, sampling inside the perimeter, and taking photographs. Finally, there are on-site negotiations for up to 72 hours followed by up to 84 hours of continuous inspection activity. [IPO-5, 1997, p.2]

A Challenge Inspection might produce confusion for a base Commanding Officer (CO) and base personnel because inspection requirements will cause the abrupt cancellation of many standard operating procedures. The Navy Arms Control Directorate International Programs Office (IPO-5) has developed an Inspection Readiness Plan to prepare the facility for the inspection and to reduce the turmoil and confusion that inevitably will follow when notification is received that a team of international inspectors will soon arrive at a given facility. The Navy has a Tiger Team on 4-hour alert in the event of a Challenge Inspection. The Tiger Team will be assigned Temporary Duty (TEMDU) to the base CO for the duration of the inspection. The Tiger Team consists of 20 technical experts/treaty experts and is led by a Navy O-5/GM-15.

This treaty, Tiger Team, or IPO-5 support does not relieve the CO of any of his or her safety or security obligations. These responsibilities need to be taken into account during the initial perimeter negotiations at the POE.

B. INTENT OF THESIS

This thesis examines current Information Technology (IT) initiatives in an effort to maximize naval base preparation time and CO inclusion in the decision-making process during the initial notification and preparation phase of the CWC, especially at overseas locations. It focuses primarily on the use of videoconferencing and other multimedia applications as a means of including the CO and key base personnel in the perimeter

negotiations at the POE. These initiatives will serve as a means of keeping the CO and key base personnel informed of any real-time developments prior to the Tiger Team and international inspection team's arrival as well as offering a way to facilitate base escort training. This thesis will also include the results of a survey of Computer Infrastructure that was mailed out to various commands. This survey provided information used to describe existing telecommunications, computing, and videoconferencing capabilities.

There is currently no way, with the exception of audioconferencing via the use of a speakerphone at the host team table at the On-Site Inspection Agency (OSIA), to include the base CO in the Perimeter discussions or to take care of issues as they come up during initial host-team meetings. This thesis examines the various methods of videoconferencing with a very thorough discussion of the various industry standards. This will aid IPO-5 in the selection of the videoconferencing strategy that is fiscally sound and achieves the objectives of base inclusion in the host team process.

Additionally, IPO-5 has not devised a backup plan in the event that the Tiger Team can not reach a base in a timely fashion. This is not a problem for facilities located in the Continental United States (CONUS), Alaska, or Hawaii, but this may present serious challenges at an overseas location where the United States military is a tenant at a host nation facility which is being challenged.

There also needs to be a more economical way of distributing IPO-5's Inspection Readiness Plan (IRP) for Department of the Navy (DON) facilities. Currently, this very thorough inspection plan is slated to be mailed out and subsequent revisions would also be

mailed to the various recipients. There is currently no backup plan in the event that the facility loses control of the IRP. This thesis explores other options of getting this information to facilities facing a Challenge Inspection.

Finally, IPO-5 has developed a web page for the Internet. This thesis suggests a web page strategy for IPO-5 so that everyone with Internet access can view the web page regardless of the browser being used.

C. DISCUSSION OF CONTENTS

Chapter II introduces the reader to the CWC Challenge Inspection timeline. It also includes an introduction to, and a discussion of, the IRP. Finally, this chapter describes the IPO-5 Tiger Team, especially the responsibilities of the key Tiger Team members.

Chapter III introduces the reader to videoconferencing and its application to the CWC Challenge Inspection process. It includes a discussion of the different types of videoconferencing, video compression, videoconferencing equipment, the International Telecommunications Union, videoconferencing standards, and the feasibility of utilizing videoconferencing.

Chapter IV reviews the results of the Computer Infrastructure Questionnaire. The chapter also identifies the differences between CONUS and OCONUS commands. This will provide the reader with an appreciation for the telecommunication capabilities of the various facilities that may be inspected under the CWC and for the existing computing power at these facilities.

Chapter V discusses inputs for the Information Technology process improvements to the Navy's Inspection Plan under the CWC. It will start with the recommendation for

the videoconferencing strategy. This chapter also discusses alternatives to mailing out the IRP and replacing it on short notice should the situation arise as well as a recommendation in the event that the Tiger Team cannot reach a particular site in time. This chapter concludes with a discussion on the web site strategy for IPO-5 that will entail the type of web browser that the web site should be able to read along with recommendations for items to include on the web site.

II. CWC CHALLENGE INSPECTION

A. CWC TIMELINE

The CWC Challenge Inspection is an intrusive inspection with a rigorous timeline. The Challenge Inspection will begin when "a signatory State Party to the CWC makes a request to the Organization for the Prohibition of Chemical Weapons (OPWC)" [IRP, 1997, p.iii]. This request will include all of the evidence that the state party has gathered to reinforce their position for the OPWC to conduct a challenge inspection of a suspected Chemical Weapons facility in the target country. If accepted, the OPWC will then issue a mandate to the target country indicating their intent to conduct a Challenge Inspection under the CWC. This mandate will also include the original request from the requesting state party, the justification provided to the OPCW, and the composition of the International Inspection Team (IIT). The requesting state party can send an observer, but this observer is not to participate in the inspection. Once the Challenged country receives this mandate, the inspection clock starts.

US government procedures call for the formation of a host team upon receipt of this mandate. This host team will act as the US government representative. The host team leader will usually be a member of the Joint Staff. The rest of the host team will have representatives from each of the four services. The host team will then meet the IIT at the point of entry (POE) which is designated as the On-Site Inspection Agency (OSIA) at Dulles International Airport. The IIT will arrive at the POE no later than 12 hours after receipt of the mandate. The IIT leader will give the host team leader the requested perimeter around the challenged facility. The Navy representative will then transmit the

perimeter to the facility CO. The challenged state party must begin self-monitoring at the specified location 12 hours after the IIT arrival at the POE. This self-monitoring "consists of monitoring in a manner that will provide a permanent record (i.e., traffic logs, videotapes, air operations logs, and/or harbor logs) of all vehicular traffic exiting the requested inspection perimeter"[IRP, 1997, p.iv]. It is therefore imperative, that this information be disseminated to the facility expeditiously.

The next hurdle in the inspection timeline is the transport of the IIT to the facility. Negotiations on the location of the perimeter and various briefings will be conducted at OSIA, but they must be concluded in time for the IIT to be at the perimeter of the facility 36 hours after their arrival at the POE.

If the perimeter has not been agreed to prior to the IIT arrival at the facility, negotiations will continue at a predetermined place located outside of the facility. The host team and the IIT have up to 72 hours after their arrival at the facility to negotiate the final perimeter. If there is no agreement, the alternate perimeter offered by the host team will become the final perimeter and the inspection will commence. The IIT cannot physically cross the perimeter until the perimeter issue is settled.

The IIT must be provided access within the final perimeter no later than 108 hours after its arrival at the POE. IIT inspection within the perimeter may continue for up to 84 continuous hours. Inspection activities may include record reviews, personnel interviews, photography, sampling and the physical inspection of structures, areas, and equipment inside the inspection boundary. [IRP, 1997, pp. iv-v]

The final phase of the CWC Challenge inspection is the IIT presentation of its preliminary findings. The IIT has no more than 24 hours after the inspection to present

these findings. The inspection unfolds according to a tight timeline; tasks must be completed within a specific timeframe.

B. INSPECTION READINESS PLAN

Any Naval facility, whether it is located inside or outside of the continental United States, might be inspected under the CWC treaty. Inspection under the CWC treaty, however, is so unlikely that base COs should realistically focus on their missions and normal routines. The Navy created a manual that would aid the challenged facility's command and support staff. This book is called the Inspection Readiness Plan for Department of the Navy Facilities in response to Chemical Weapons Convention Challenge Inspection, or IRP for short.

The IRP is provided to facilities that may be subject to a CWC Challenge Inspection. The IRP begins with an executive summary, the basic plan on how to conduct an inspection, and a description of the various phases of the inspections as well as the key events that are to be conducted during each phase. The key parts of the book are the checklists for the key facility positions and functions such as the CO, Challenge Inspection Officer (CIO), Inspection Operations Center, Base Preparation, Base Escorts, Self-Monitoring, Physical Security, Operations Security, Counterintelligence, Safety, Communications, Supply, Public Affairs, Legal, and Medical/Dental. These sections also have various Appendices that further delineate tasks to be completed or provide some form of amplifying information to the person filling key base positions.

Key facility positions and functions such as the CIO, Inspection Operations Center, Base Preparation, Base Escorts, and Self-Monitoring are highlighted by the IRP. The CIO

is designated by the CO and is responsible for the overall management and coordination of Challenge Inspection preparation and support activities. The CIO is the CO's primary representative during the course of a CWC Challenge Inspection. This person has many duties such as coordinating the activities that must be done prior to the arrival of the Tiger Team, preparing and presenting the pre-inspection briefing, providing direction to all of the inspection activities from the Inspection Operations Center and assisting the CO during the perimeter negotiations. [IRP, 1997, p. B-1]

The Inspection Operations Center is the facility's command and control center for managing the CWC Challenge Inspection process. All information will come into and go out of the Inspection Operation Center. It is also used to communicate with the higher-level chain of command and IPO-5. Support functions that are handled from here are transportation, supply administrative support operations, recording of all inspection-related activities, and briefings. [IRP, 1997, p. C-1]

Base Preparation readies the installation to accomplish those tasks necessary to meet the requirements of the CWC Treaty provisions for challenge inspections while protecting sensitive, classified, and proprietary programs from inadvertent disclosure. Base preparation facilitates the inspection. The Base Preparation Coordinator highlights any sensitive areas and protects other areas' classified material. Additionally, this process communicates the seriousness of this inspection to the entire facility. [IRP, 1997, p. D-1]

The Base Escorts "make an important contribution toward the success of a challenge inspection" [IRP, 1997, p. E-1]. The base escorts are the ones that know the base and all of the buildings, structures, and entry points onto the base. The base escorts really set the tone for the inspection. "They travel with the IIT wherever the IIT goes on

the facility. Additionally, they ensure that the US Government (USG) escorts are aware of the facility's sensitivities" [IRP, 1997, p. E-1]. The USG will provide professional escorts from the OSIA to help with the inspection. They assist the base escorts and will be the primary points of contact for the IIT inspectors.

Self-monitoring must begin no later 12 hours after the IIT arrival at the POE. The facility will be required to keep a factual record of all land, air and water traffic exiting from the facility. This must continue until the IIT arrives and takes over exit monitoring from the facility. The CO will appoint someone, usually the Physical Security Officer, to coordinate this effort. Again, this will help set the tone for the inspection as this is one of the first things that the IIT will get to look at once they are allowed to cross the perimeter and conduct a turnover with the base personnel. [IRP, 1997, p. F-1]

Each of these checklists is very thorough and guides the person filling these positions with excellent information on what to do and when the particular tasks need to be accomplished. The IRP along with the Navy Tiger Team, discussed in the next section, provide support during a CWC Challenge Inspection.

C. NAVY TIGER TEAM

The CWC Challenge inspection happens on very short notice and is conducted at a fast pace. Space is required to get the IIT in and out of a facility as fast as possible in as little time as necessary for them to collect their findings. The Navy understands that this type of inspection will happen rarely and that naval base preparation may be minimal at best, so

they designated an assistance team called the Inspection Tiger Team to "support the CO and staff of a challenged facility in the event of a challenge inspection" [Tiger Team Manual, 1996, p.1].

The Tiger Team is on four-hour alert to travel in the event of a Challenge Inspection. It is to be at the inspected facility within the first 24 hours of initial notification by the OPCW to conduct a Challenge Inspection. "The Navy CWC Tiger Team provides expertise in the DON CWC Inspection Readiness Plan (IRP) and its use in CWC treaty implementation, as well as in planning policy, contracting, and inspection preparation and support directly to the Commanding Officer to meet the requirements of a CWC challenge inspection" [Tiger Team Manual, 1996, p. B-1]. Key team members include a Team Leader, Inspection Operations Center Specialist, Self-monitoring Specialist, Base Prep Specialist, Base Escort Specialist, Naval Criminal Investigative Service (NCIS) Representative, and the Treaty Information Management System (TIMS) Specialist.

The Team leader is the senior member of the team and is responsible for ensuring the team provides the required inspection preparation assistance and support to the challenged facility. The Team Leader is an expert in all aspects of CWC challenge inspection methodology. He or she has several key responsibilities. First, this person directly supports the challenged facility CO in all aspects of the inspections process, to include implementation of the IRP checklists, perimeter and inspection plan negotiation, site preparation and managed access methodologies. Second, this person provides direct liaison between the facility CO and the Navy Headquarters Treaty Operations Center (HTOC). Third, this person maintains liaison with HTOC by providing inspection status

reports as necessary. Fourth, this person manages direct tiger team efforts in support of the challenged facility inspection activities. Finally, the Team Leader assists the CO coordinate with the USG Escort Team Chief prior to and during the inspection. [Tiger Team Manual, 1996, p. B-2-3]

The Inspection Operations Center Specialist is responsible for setting up the challenged facility's operations center. This person selects the staff, conduct on-site training, set up the communications, and execute the Inspection Operations Center Coordinator portion of the IRP checklist. [Tiger Team Manual, 1996, p. B-4]

The self-monitoring specialist supports the facility's self-monitoring coordinator in all aspects of self-monitoring. This individual delivers the self-monitoring brief to the facility command and self-monitoring personnel. Additionally, this person assists with the selection, organization, and training of self-monitoring personnel. [Tiger Team Manual, 1996, p. B-4]

The Base Preparation Specialist assists the Base Preparation Coordinator in ensuring that the facility is fully prepared for a CWC Challenge Inspection. Additionally, this individual delivers the Base Preparation Training Brief to facility command and base preparation personnel and assist with selection, organization, and training of base preparation personnel. [Tiger Team Manual, 1996, p. B-5]

The Base Escort Specialist directly supports the Base Escort Coordinator in ensuring that the facility's escorts are prepared to conduct their duties and all aspects of base escort operations during perimeter monitoring and inspection activities. Additionally, this person delivers the Base Escort Training Brief to base command and escort personnel. [Tiger Team Manual, 1996, p. B-6]

The NCIS representative serves as the NCIS Headquarters representative. This person provides counterintelligence and criminal investigative support to the inspection process and to provide national-level guidance and direction to local NCIS personnel as needed. [Tiger Team Manual, 1996, p. B-6-7]

The TIMS Specialist coordinates the input of data into the various TIMS databases using two assistants, one of whom is devoted primarily to supporting the Base Preparation Coordinator. This person determines the TIMS configuration and the display and distribution of TIMS information to most effectively support Inspection Operations Center operations and Base Preparation functions. [Tiger Team Manual, 1996, p. B-7]

III. VIDEOCONFERENCING

A. OVERVIEW

The Navy's IRP calls for a Base CO to play a role in the perimeter and inspection plan negotiations only after the IIT arrives at the facility. This means that the CO's inputs are only heard and taken into account during this phase of the Challenge Inspection. During a recent mock challenge inspection conducted at Patrick Air Force Base from 3-12 April 1997, the host team used a speakerphone placed at the center of the host team's table to get the base CO involved with perimeter negotiations at OSIA. This helped the host team develop a feasible and well thought out alternative perimeter, and they were able to present this to the IIT much earlier than was expected in the timeline. Two key issues brought out by the base CO during the audio teleconference: safety and the inclusion of certain parts of the base that were not controlled by the Air Force. The only drawback at this point was that neither the host team nor the base CO could see each other, they had to rely on verbal descriptions of the base layout which had to be repeated by host team members to ensure that they understood what the base CO was trying to describe.

A better way to accomplish this task would be to incorporate videoconferencing into discussions between the host team and the base CO while the negotiations are taking place at OSIA. Sarah Albritton, a psychologist and industrial management consultant, stated that

> Audio-only teleconferences served their purpose much as radio was the first electronic form of information and entertainment. Radio still has its place, but we all want more, because we are used to more. And when it comes to teleconferences, we want pictures with our sound, lots of information, lights, and action, just like Hollywood gives us [ITCA, 1997, p.1].

Additionally, people can receive and absorb multimedia-based messages more effectively because they stimulate the eyes, ears and brain [ITCA, 1997, p. 2]. Videoconferencing will help speed the inspection process along as well as include the CO from the beginning. This will also help to keep key base personnel informed of inspection progress and help focus the CO's attention on other Challenge Inspection related matters.

To better explore the possible application of videoconferencing to the inspection process, this chapter will examine the various types of videoconferencing systems available, a brief discussion of video compression, videoconferencing equipment, the International Telecommunications Union which is the worldwide videoconferencing standards making body, and the current videoconferencing standards. This chapter will conclude with a feasibility analysis of the inclusion of videoconferencing in the CWC Challenge Inspection process.

B. TYPES OF VIDEOCONFERENCING

There are three ways to conduct videoconferencing. The first is to have a room totally dedicated to videoconferencing. The second is to have a mobile videoconferencing unit, which can be carried in a large carrying case. The third, and increasingly popular, way is to use existing Personal Computers to conduct videoconferencing from the desktop.

Rooms dedicated to videoconferencing have been built in many naval facilities. These rooms are routinely used for distance learning and conferences. These rooms typically use high quality audio-visual components, sophisticated coders/decoders (codecs), and feature-rich interface devices to create and experience suitable for a room full of participants [Pacific Bell, 1997, p. 3]. The drawback of this type of videoconferencing is that it is the most costly of the three ways that are now available. In today's austere fiscal environment, the justification for such a system would be very hard to provide.

The mobile teleconferencing unit is a relatively new product. This unit comes with a camera and codec and plugs into existing ISDN phone jacks. The user must provide a monitor. This unit is ideal for the person who wants to conduct videoconferences from various locations. This is the second most costly way of conducting videoconferences: the cost for one of these units is about $8,000 in 1997. The drawback of this type of videoconferencing is that it is only works with ISDN phone lines.

Desktop videoconferencing systems use a personal computer and special hardware and software. This kind of system uses cheaper components and is most appropriate for individual or small group use. Desktop systems often include a document-sharing feature, which allows participants to see and edit a computer document as they see and hear each other. Document sharing and the relatively low cost of desktop system make this an ideal tool for communication and collaboration. This type of videoconferencing is becoming popular because of its cost to the average consumer. The only drawback to this type of system is that it is only good for an individual or small groups. [Pacific Bell, 1997, p.3]

C. VIDEO COMPRESSION

Bandwidth, cost, and interoperability are the dominant issues when discussing videoconferencing capabilities. Bandwidth, however is the most dominant of the three. Full motion video requires that a large amount of information must be transmitted in a short amount of time. The only way to transmit analog full motion video, therefore, is to use a large amount of bandwidth. To transmit analog full motion video that has not been compressed and digitized requires a transmission medium equal to a full satellite transponder. The problem was finding a way to both transmit this type of video and utilize smaller and cheaper transmission mediums such as existing phone lines. [Churchwell, 1994, pp. 6-7]

The advent of digital signal processing did not immediately reduce the large bandwidth required for full motion video signals. In fact, the cost and bandwidth requirements increased because digital full motion video required a transmission bandwidth of 80 MBPS or more. What digital technology did provide was the ability to use video compression techniques to reduce the bandwidth required to as little as 56 KBPS which can be handled utilizing existing phone lines. [Churchwell, 1994, p.7]

D. VIDEOCONFERENCING EQUIPMENT

The components that make up most videoconferencing systems are a video camera, a video coder-decoder (codec), a multiplexer/demutliplexer and a network adapter. "The video camera simply captures the picture (either still or in motion) and then routes it to the video codec" [Churchwell, 1994, p.7]. The codec is the most important part of the videoconference system. "It compresses the video and acts as an interface

between all of the equipment in the room and the network. A codec must be located at each location" [Phillips, 1997, p.5]. The multiplexer/demultiplexer is used to break the coded message up into packets or frames and sends the digital signal to the network adapter, which finally sends the signal out to its destination. [Churchwell, pp. 7-8] Modern systems only use multiplexer/demultiplexers with systems that require bandwidths of 384 KBPS or 3 Basic Rate Interfaces (BRI) which is the same as 3 ISDN phone lines. If the system is 112 KBPS, or 1 BRI (which is 1 ISDN phone line), a multiplexer is not needed.

This section would not be complete, however, without discussing modulators/demodulators (modems). The previous section only discussed ISDN videoconferencing systems. DTVC systems are now capable of utilizing the existing phone lines, commonly called the Plain Old Telephone System (POTS). A high-speed (V.34) modem is required and the consumer must purchase a codec and POTS/ISDN multiplexer in order to utilize videoconferencing from the desktop PC.

E. INTERNATIONAL TELECOMMUNICATIONS UNION

Standards play a key role in the telecommunications industry. They are required to specify the physical, electrical, and procedural characteristics of communications equipment [Stallings and Van Slyke, 1994, p. 625]. Standards provide many benefits to both the consumer and vendor. Chief among these is that a standard allows products from many vendors to communicate, giving the purchaser more flexibility in equipment selection and use [Stallings and Van Slyke, 1994, p.635]. The standards making body for videoconferencing is the International Telecommunications Union (ITU) which is a sub-

element of the United Nations' Economic and Social Council. The ITU consists of three branches, the Radiocommunication Sector, the Telecommunication Standardization Sector, and the Telecommunication Development Sector [Couch and Stidam, 1995, p. 49].

Within the ITU, the group charged with overseeing the telecommunication standards is a committee called the Telecommunication Standardization Sector which is abbreviated ITU-T. They are responsible for publishing the recommendations that address videoconferencing. The ITU-T receives its mandate from the World Telecommunication Standardization Conference (WTSC), which meets every four years and presents the ITU-T Study Groups with topics for research. The ITU-T then produces recommendations based on those topics. [Couch and Stidam, 1995, p. 49]

F. VIDEOCONFERENCING STANDARDS

There are four main standards that are associated with multimedia teleconferencing. They are ITU-T T.120, H.320, H.323, and H.324. The T.120 standards address Real Time Data Conferencing (Audiographics), the H.320 standards address ISDN Videoconferencing, the H.323 standard addresses Video (Audiovisual) communication on local area networks, and the H.324 standard addresses High Quality Video and Audio compression over POTS modem connections. [IMTC, T.120, 1997, p.1]

The T.120 standards cover the data-sharing portion of a multimedia conference. These standards specify how to distribute files and graphical information in real-time during a multipoint multimedia meeting. The objective is to assure interoperability between terminals without either participant assuming prior knowledge of the other

system; permit data sharing among participants in a multimedia teleconference, including white board image sharing, graphic display information, and image exchange; and, specify infrastructure protocols for audiographic or audiovisual applications. These standards also govern the audio graphic portion of the H.320, H.323, and H.324 series. T.120 can operate within these standards or by itself. The T.120 series of recommendations are contained in Appendix B. [IMTC, T.120, 1997, pp. 1-2]

The H.320 series of standards cover the basic videotelephony concepts of audio, video and graphical communications by specifying the requirements for processing audio and video information, providing common formats for compatible audio/video inputs and outputs, and protocols that allow a multimedia terminal to utilize the communications links and synchronization of audio and video signals. H.320 applies to both multipoint and point-to-point sessions and addresses videoconferencing over circuit switched services like ISDN or Switched-56. The H.320 series of recommendations are contained in Appendix C. [IMTC, H.320, 1997, pp.1-2]

The H.323 standard is an extension of H.320. Since 1990, many corporations have implement Local Area Networks (LAN) and LAN gateways to the Wide Area Network (WAN). The H.323 suite is a logical and necessary extension of the H.320 standard to include Corporate Intranets and packet-switched networks. Because it is based on the Real-Time Protocol, H.323 can also be applied to video over the Internet and applies to both multipoint and point-to-point sessions. The H.323 series of recommendations are contained in Appendix D. [IMTC, H.323, 1997, pp. 1-2]

The H.324 standard addresses and specifies a common method for sharing video, data, and voice simultaneously using high-speed (V.34) modem connections over a POTS

line. It also specifies interoperability so that products based on H.324 will be able to connect and conduct a multimedia session. H.324 has the broadest impact on the marketplace because the common user will now have access to videoconferencing right from their home PC because this standard utilizes the most common worldwide phone system: POTS. The H.324 series of recommendations are contained in Appendix E. [IMTC, H.324, 1997, pp. 1-2]

G. VIDEOCONFERENCING FEASIBILITY

On the surface, the inclusion of videoconferencing in the Challenge Inspection process is very feasible. There are many systems that IPO-5 could purchase in order to conduct videoconferencing, but what is the right system? Purchasing a room dedicated to videoconferencing can definitely be ruled out as the cost involved would be too much. The portable videoconferencing system or the desktop videoconferencing system seem to be better, and more fiscally sound, options. The problem, however, is what standard compliant system should IPO-5 purchase should they decide to include videoconferencing? There is also the question of the types of telecommunications lines that exist at naval facilities likely to be inspected, and if they are likely to be upgraded or will remain the same. Additionally, these facilities themselves may be currently taking advantage of videoconferencing that may preclude the need for IPO-5 to purchase a system. In order to answer these questions, a questionnaire was mailed out to various naval facilities. The questionnaire and the results are the subject of Chapter 4.

IV. COMPUTER INFRATSTRUCTURE QUESTIONNAIRE

A. METHODOLOGY

To ascertain the feasibility of including videoconferencing in the CWC Challenge Inspection process, it was necessary to find out what types of computers and what types of communication lines were available at these facilities. The author determined that the most effective way of answering these questions was to use mail questionnaires. In addition to finding out if videoconferencing was feasible, the results of the questionnaire would also help to determine if there were other Information Technology alternatives that would help to improve the CWC Challenge Inspection process.

The list of naval commands to which the survey was mailed was provided by IPO-5. The commands on this list were determined by IPO-5 as likely to be subject to a CWC Challenge Inspection. These commands were further categorized by being listed in one of the following categories: Critical, High Priority, Out of the Continental United States (OCONUS), Other, Reserve Centers, and Routine.

The questionnaire consisted of six fill-in questions for the Command name and five optional categories. This was followed by 20 multiple-choice questions. The questionnaires were grouped into four sets. The first set of multiple-choice questions dealt with the type of computers, CD-ROM capabilities, modems, and types of Operating Systems. The second set of questions dealt with Internet and Global Command and Control System (GCCS) access, type of Internet connections, and type of Internet or GCCS browser used. The third set of questions dealt with the Integrates Services Digital Network (ISDN). The final set of questions dealt with the use of videoconferencing.

The questionnaire was mailed out using addresses in the Standard Naval Distribution List (SNDL). A total of 157 questionnaires were mailed. It was determined that the commands in the "Critical," "High Priority," "OCONUS," and "Other" categories were the most important, so questionnaires were sent to each command in these categories. The one exception to this, however, was the Marquardt Company in Van Nuys, California. It was excluded from participation, even though IPO-5 listed this company in the "Critical" category, because this questionnaire concentrated on naval facility capabilities. It was determined that the responses received from this company would not reflect those of a typical naval command. The commands in the "Reserve Centers" and "Routine" categories were chosen by random selection of every other command commencing with the first command in each category. There were occasions, however, where a command that was listed on the IPO-5 list no longer existed, so it was either replaced with the next command on the list or a command that was geographically near by. The list of commands to which the questionnaires were mailed is included as Appendix F.

The questionnaire had a response rate of 42.7 percent. This is a very high response rate. The normal response rate for a questionnaire is around 30 percent. 10.8 percent of the questionnaires, however, were returned unanswered for various reasons. 7.6 percent were returned because the commands were closed due to the downsizing. 3.2 percent were returned because the commands moved or were consolidated, the addresses had changed, or the commands refused to accept the questionnaire. The list of commands that responded to the questionnaire, and the commands whose questionnaires were returned is included as Appendix G.

The remainder of this chapter will examine the results of each multiple-choice question in the questionnaire. The results were obtained by dividing the number of responses by the total number of possible respondents to a question. As an example, respondents would only answer the ISDN section of the questionnaire if they did not have ISDN or were expecting to upgrade their system to ISDN, but all respondents would answer the question on whether or not they were using ISDN. The final part of this chapter will include a discussion of CONUS and OCONUS results as well as an overall analysis.

B. QUESTIONNAIRE RESULTS

1. Which of the following computer processors are at your command?

This is questionnaire question number 7. The respondents could, and did, check more than one response. The results of this question can be seen in Table 1.

Processors	286, 386, 486	P75	P100	P133	P166	P200	All of the Above	None of the Above
Percentage	64.2	40.3	52.2	43.2	37.3	31.3	33.8	0

Table 1. Statistical Findings of Questionnaire Question Number 7.

There was one write-in answer to this question. One respondent indicated that they were using a Macintosh PowerPC.

2. Do your computers have CD-ROM and Are your CD-ROMs multimedia or text only?

This is a combination of questionnaire questions number 8 and 9. The only respondents that answered question 9 were respondents who indicated that they had CD-ROMs. Additionally, one respondent indicated that they had "very few" CD-ROMs.

Questionnaire question number 9 was a bad question. The respondents, however, answered the question with a variety of answers. As a result, the answer "Yes" became "Yes," "Multimedia," and "some multimedia, some text." The answer "No" became "No" and "text only." The findings of both questions can be seen in Table 2.

Response	YES (CD-ROM)	NO (CD-ROM)	YES (Multimedia)	NO (Text only)
Percentage	95.5	3.0	85.1	9.0

Table 2. Statistical Findings of Questionnaire Questions 8 and 9.

3. What type, or types, of modems do you have at your command?

This is questionnaire question number 10. The respondents could, and did, check more than one type of modem. The result was that respondents have a mixture of different modems at their commands. The findings of this question can be seen in Table 3. Figure 1 is a bar chart of the findings in Table 3.

Modems	14.4 KBPS	28.8 KBPS	33.6 KBPS	56 KBPS	All of the Above	None of the Above
Percentage	61.2	61.2	35.8	4.5	23.9	1.5

Table 3. Statistical Findings of Questionnaire Question Number 10.

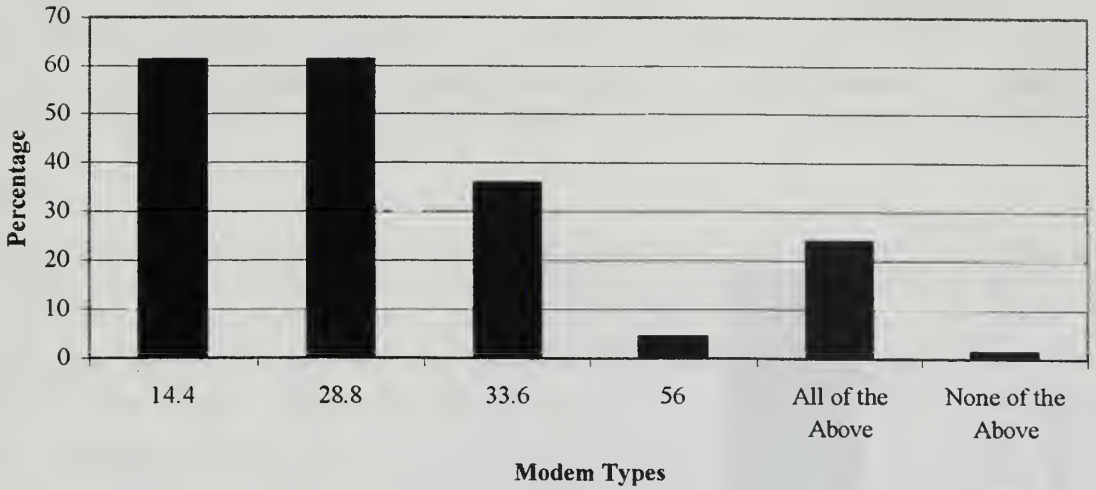

Figure 1. Statistical Findings of Questionnaire Question Number 10.

4. What type, or types, of operating systems are your computers using?

This is questionnaire question number 11. Again, commands are utilizing more than one type of computer operating system. The findings of this question can be seen in Table 4.

Operating System	Windows 3.1	Windows 95	Windows NT	UNIX	DOS	Other	Don't know
Percentage	92.5	77.6	55.2	44.8	58.2	25.4	0

Table 4. Statistical Findings of Questionnaire Question Number 11.

Figure 4. Statistical Findings of Questionnaire Question Number 11.

5. Does your command have access to the Internet?

This is questionnaire question number 12. The findings of this question can be seen in Table 5. Figure 2 is a bar chart of the findings in Table 5.

Answers	Yes	No	Don't Know
Percentage	94.0	4.5	0

Table 5. Statistical Findings of Questionnaire Question Number 12.

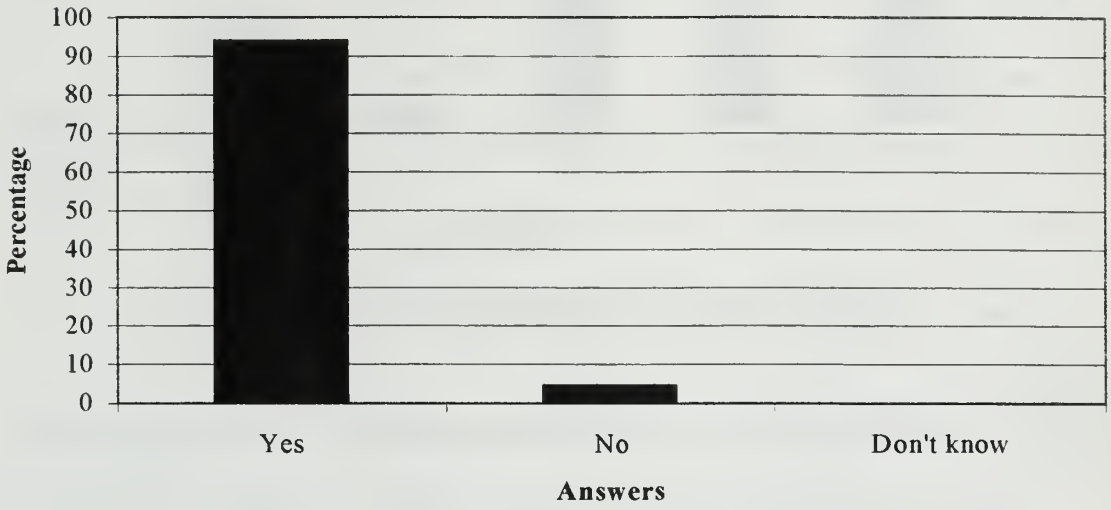

Figure 2. Statistical Findings of Questionnaire Question Number 12.

6. What type of Internet connection does your command have?

This is questionnaire question number 13. This was another question in which the respondents could select more than one answer. The majority of the respondents used a T1 communications line for their Internet connection. A T1 line is capable of speeds up to 1.544 MBPS. The second largest category was the "Other" category. Respondents were asked to write in the type of Internet connection if they selected this category. Some of the responses were the Internet Protocol Router Network (NIPRNET), Direct contact NIPRNET, Defense Research Engineering Network (DREN), NIPRNET via

Asynchronous Transfer Mode (ATM), Joint Worldwide Intelligence Communications System (JWICS), Netscape, America Online Internet, and an Internet Service Provider. The findings of this question can be seen in Table 6. Figure 3 is a bar chart of the findings in Table 6.

Internet Connection	Dial Up	SIPRNET	T1	None of the Above	All of the Above	Other	Don't know
Percentage	28.4	10.4	38.8	0	7.5	35.8	3

Table 6. Statistical Findings of Questionnaire Question Number 13.

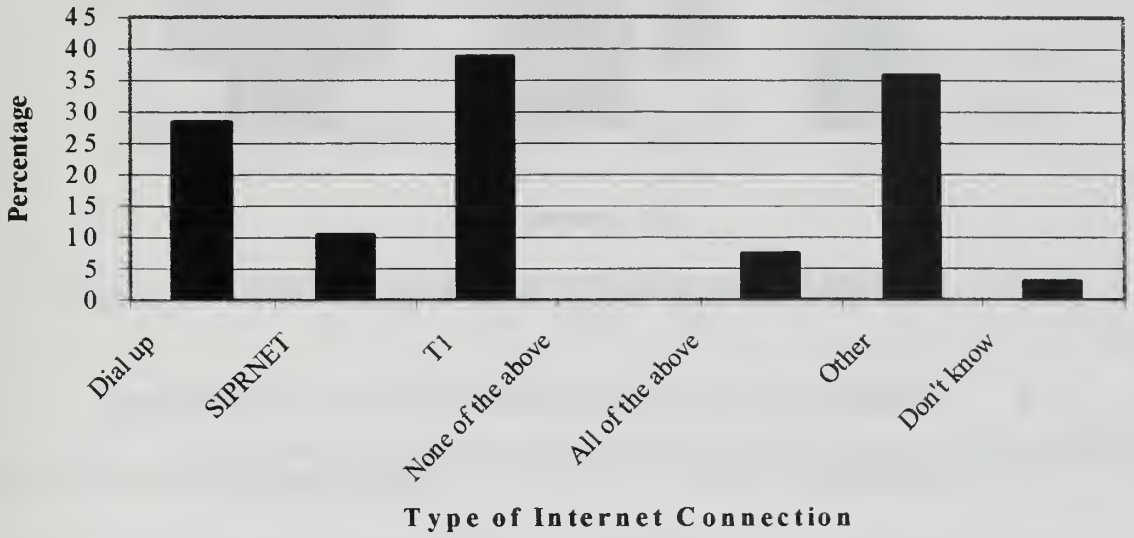

Figure 3. Graphical Results of Questionnaire Question Number 13.

7. Does your command have access to Global Command and Control System (GCCS)?

This is questionnaire question number 14. The findings of this question can be seen in Table 7. Figure 4 is a bar chart of the findings in Table 7.

Answers	Yes	No	Don't Know
Percentage	14.9	59.7	22.4

Table 7. Statistical Findings of Questionnaire Question Number 14.

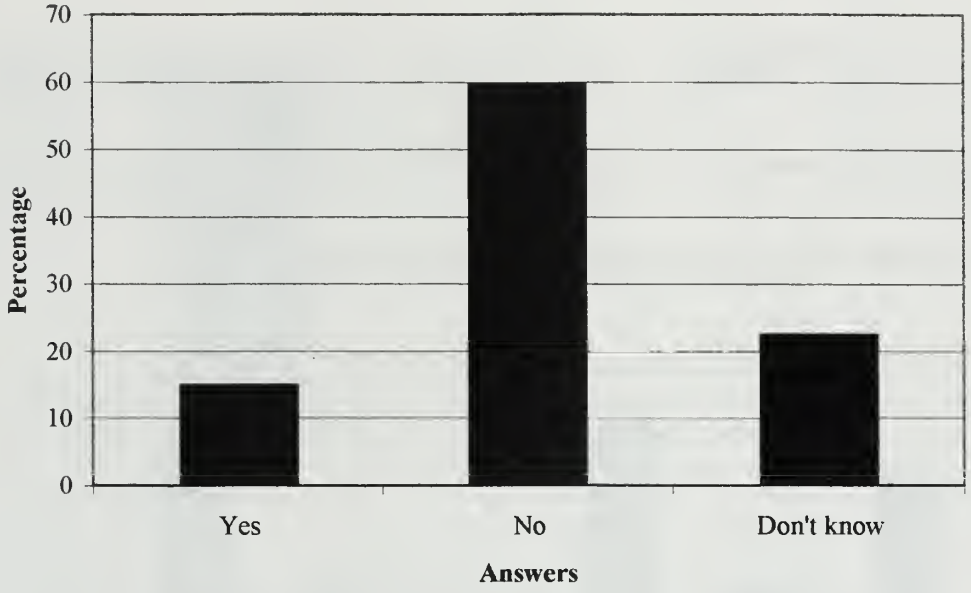

Figure 4. Statistical Findings of Questionnaire Question Number 14.

8. What browser and version number does your command use?

This is questionnaire question number 16. Many respondents selected more than one type of web browser. 13.1 percent of respondents selected the "Other" category. Some of the responses were Purveyor, All of the above, WINWEB, America Online Net Find, LOTUS INTERNOTES 4.51, Mosaic, and Netscape 4.0. The findings of this question can be seen in Table 8. Figure 5 is a bar chart of the findings in Table 8.

Browsers	Netscape Navigator 2.0	Netscape Navigator 3.0	Microsoft Internet Explorer 2.0	Microsoft Internet Explorer 3.0	Other	Don't Know
Percentage	29.5	73.8	27.9	64.2	13.1	0

Table 8. Statistical Findings of Questionnaire Question Number 16.

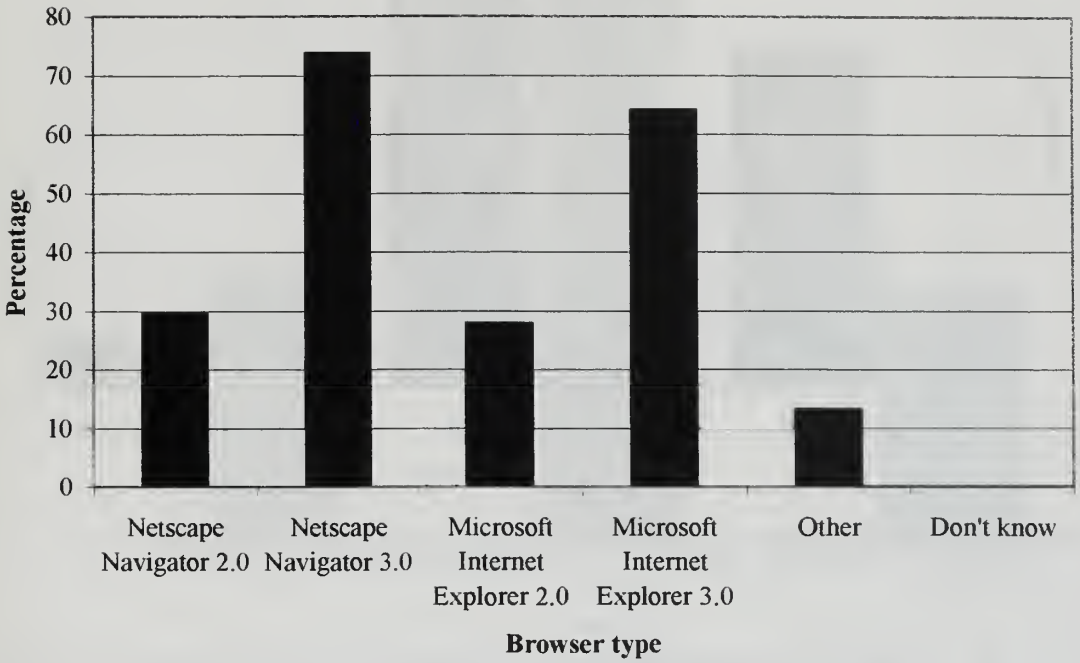

Figure 5. Statistical Findings of Questionnaire Question Number 16.

9. Does your command have Integrated Services Digital Network (ISDN) phone line access?

This is questionnaire question number 17. The findings of this question can be seen in Table 9. Figure 6 is a bar chart of the findings in Table 9.

Answers	Yes	No	Don't Know
Percentage	38.8	55.2	6.0

Table 9. Statistical Findings of Questionnaire Question Number 17.

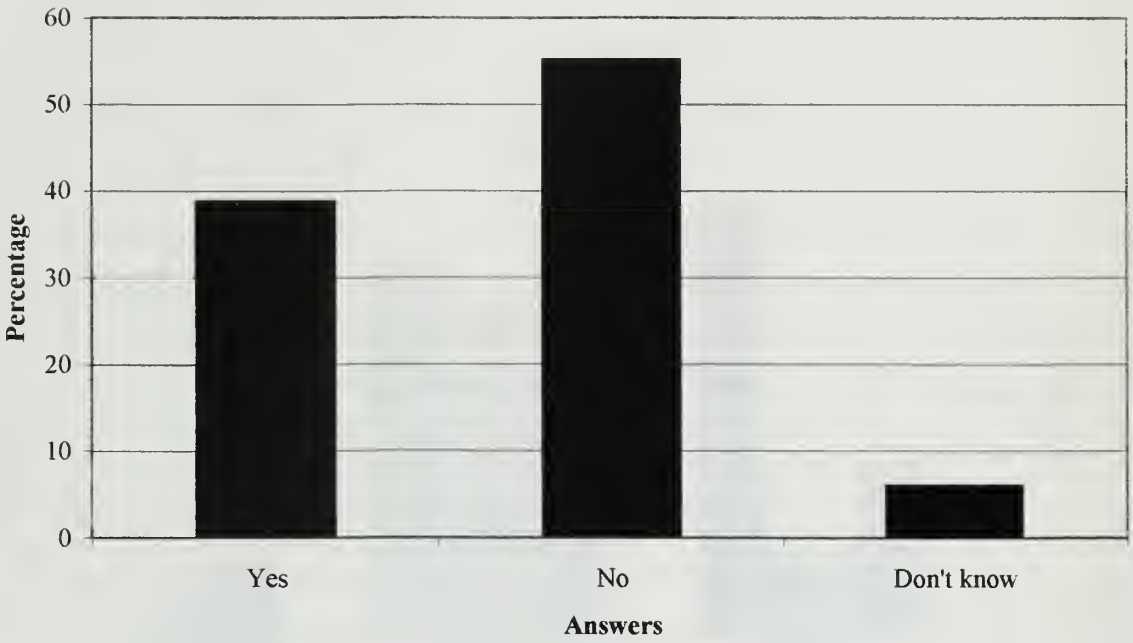

Figure 6. Graphical Results to Questionnaire Question Number 17.

10. Does your command plan to upgrade your existing phone line up to ISDN?

This is questionnaire question number 18. Only the respondents who answered "No" or "Don't know" to the previous question answered this question. The findings of this question can be seen in Table 10. Figure 7 is a bar chart of the findings in Table 10.

Answers	Yes	No	Don't Know
Percentage	26.8	56.1	24.3

Table 10. Statistical Findings of Questionnaire Question Number 18.

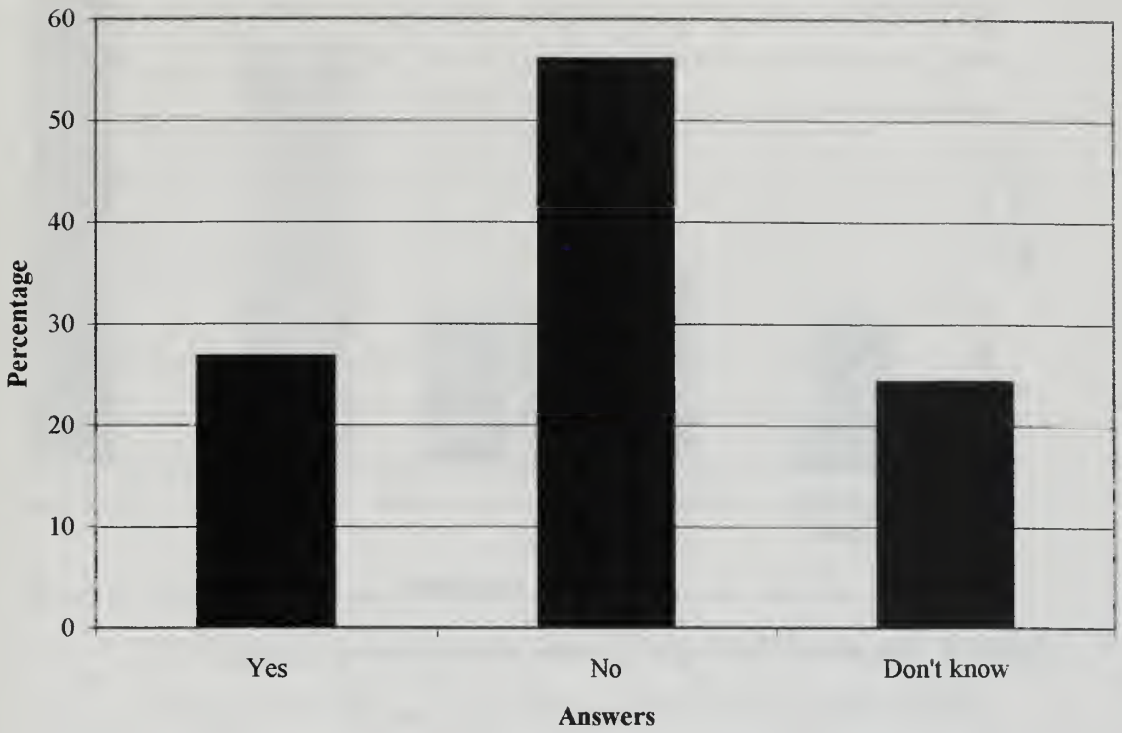

Figure 7. Statistical Findings of Questionnaire Question Number 18.

11. What is the expected timeframe for the upgrade?

This is questionnaire question number 19. The respondents who answered "Yes" or "Don't know" to the previous question answered this question. The findings of this question can be seen in Table 11. Figure 8 is a bar chart of the findings in Table 11.

Timeframe	Less than 6 months	6 months to 1 year	1 year to 2 years	Greater than 2 years	Don't know
Percentage	14.3	19.0	14.3	4.8	47.6

Table 11. Statistical Findings of Questionnaire Question Number 11.

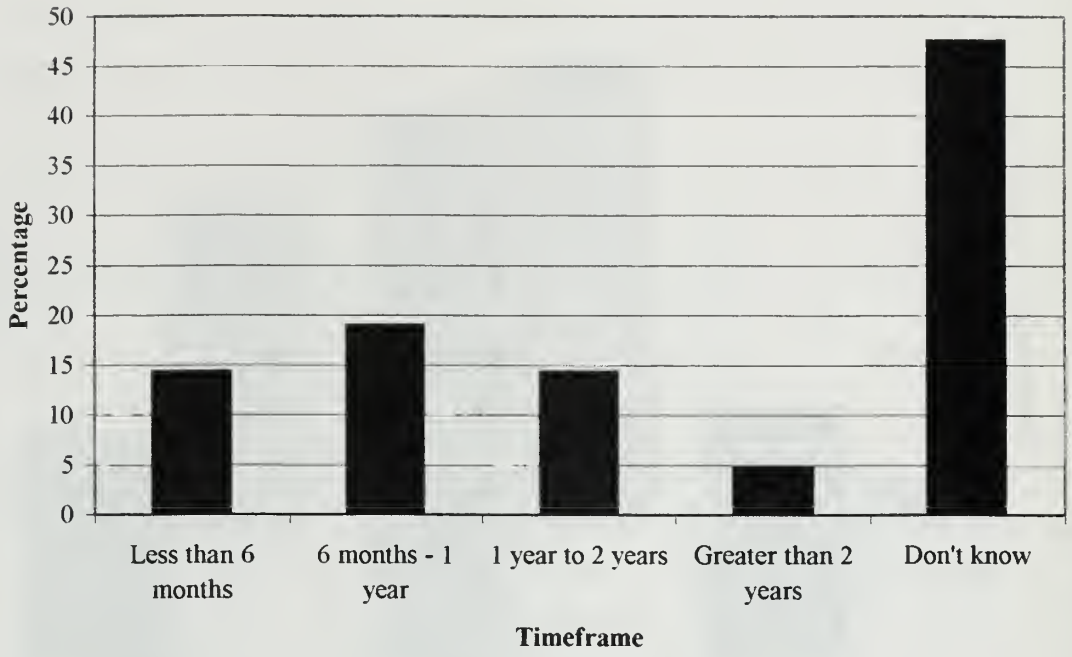

Figure 8. Statistical Findings of Questionnaire Question Number 19.

12. Is there someone at your command that is knowledgeable about ISDN?

This is questionnaire question number 20. The findings of this question can be seen in Table 12. Figure 9 is a bar chart of the findings in Table 12.

Answers	Yes	No	Don't Know
Percentage	73.1	28.4	4.5

Table 12. Statistical Findings of Questionnaire Question Number 20.

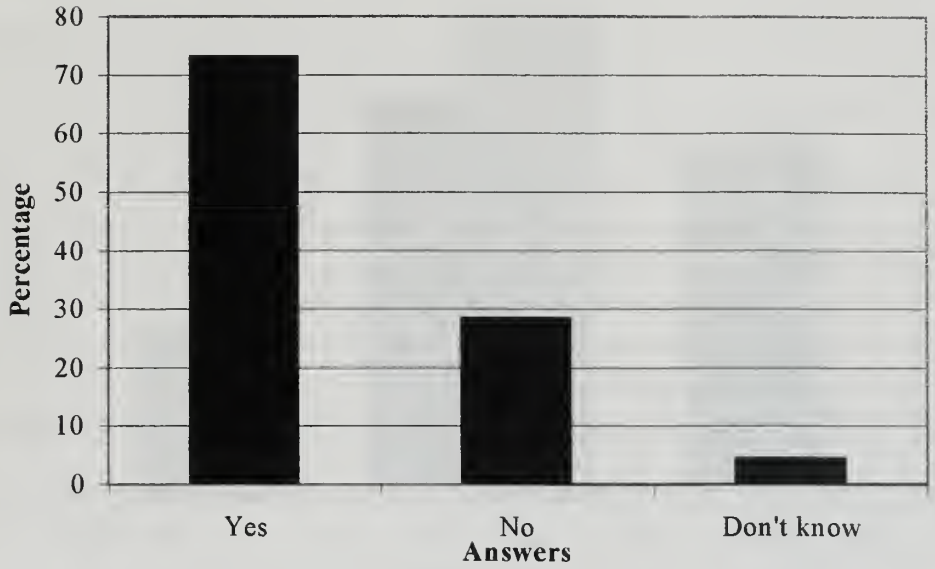

Figure 9. Statistical Findings of Questionnaire Question Number 20.

15. Does your command currently use Video Teleconferencing?

This is questionnaire question number 21. The findings of this question can be seen in Table 13. Figure 10 is a bar chart of the findings in Table 13.

Answers	Yes	No	Don't Know
Percentage	46.3	53.7	0

Table 13. Statistical Findings of Questionnaire Question Number 21.

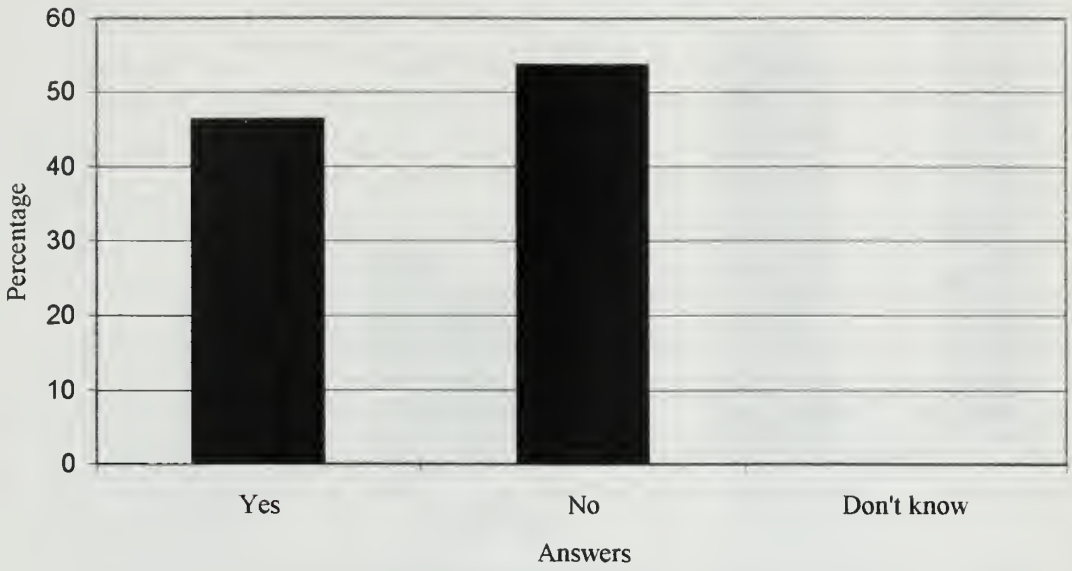

Figure 10. Statistical Findings of Questionnaire Question Number 21.

14. Do you use Video Teleconferencing via the Internet?

This is questionnaire question number 22. Only the respondents that answered "Yes" to the previous question answered this question. The findings of this question can be seen in Table 14. Figure 11 is a bar chart of the findings in Table 14.

Answers	Yes	No	Don't Know
Percentage	25.8	74.2	0

Table 14. Statistical Findings of Questionnaire Question Number 22.

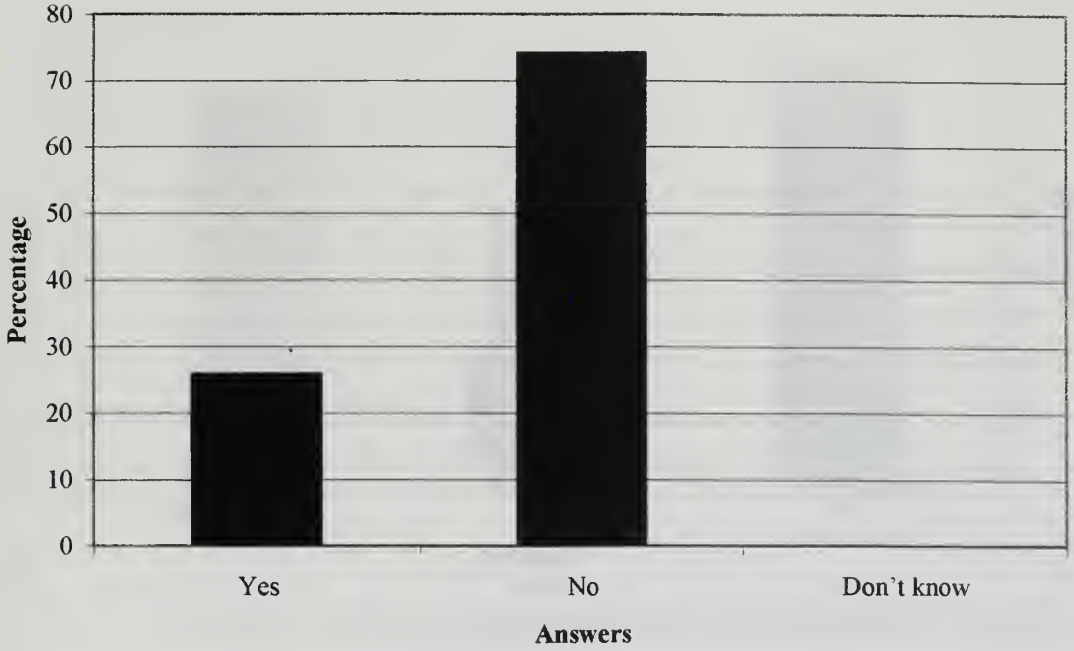

Figure 11. Graphical Results of Questionnaire Question Number 22.

15. Do you have a separate room dedicated to Video Teleconferencing?

This is questionnaire question number 23. Only the respondents using videoconferencing answered this question. The findings of this question can be seen in Table 15. Figure 12 is a bar chart of the findings in Table 15.

Answers	Yes	No	Don't Know
Percentage	77.4	22.6	0

Table 15. Statistical Findings of Questionnaire Question Number 23.

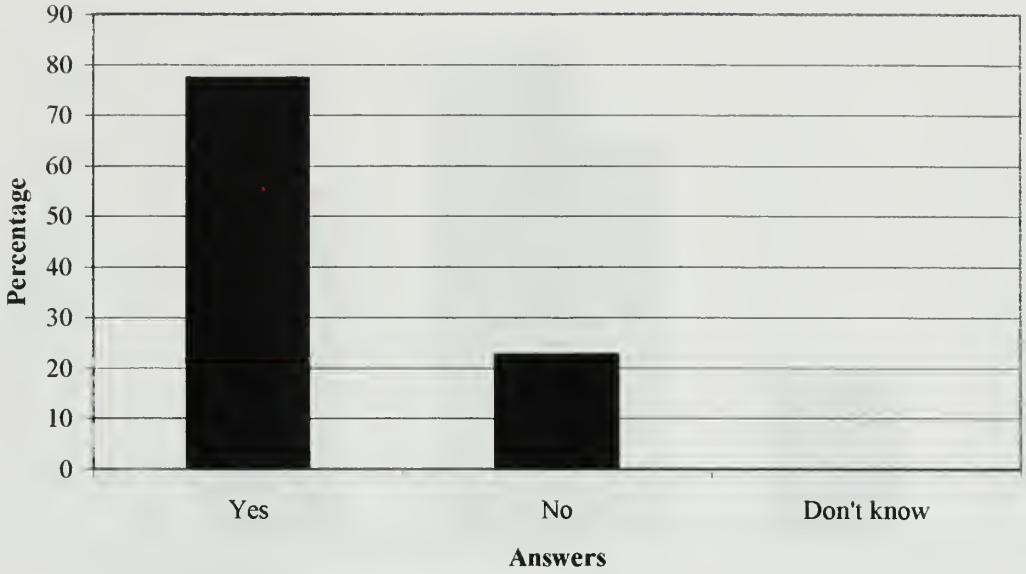

Figure 12. Statistical Findings of Questionnaire Question Number 23.

16. Do you conduct training with your Video Teleconferencing system?

This is questionnaire question number 24. Again, only the respondents using videoconferencing systems answered this question. The findings of this question can be seen in Table 16. Figure 13 is a bar chart of the findings in Table 16.

Answers	Yes	No	Don't Know
Percentage	54.8	38.7	3.2

Table 16. Statistical Findings of Questionnaire Question Number 24.

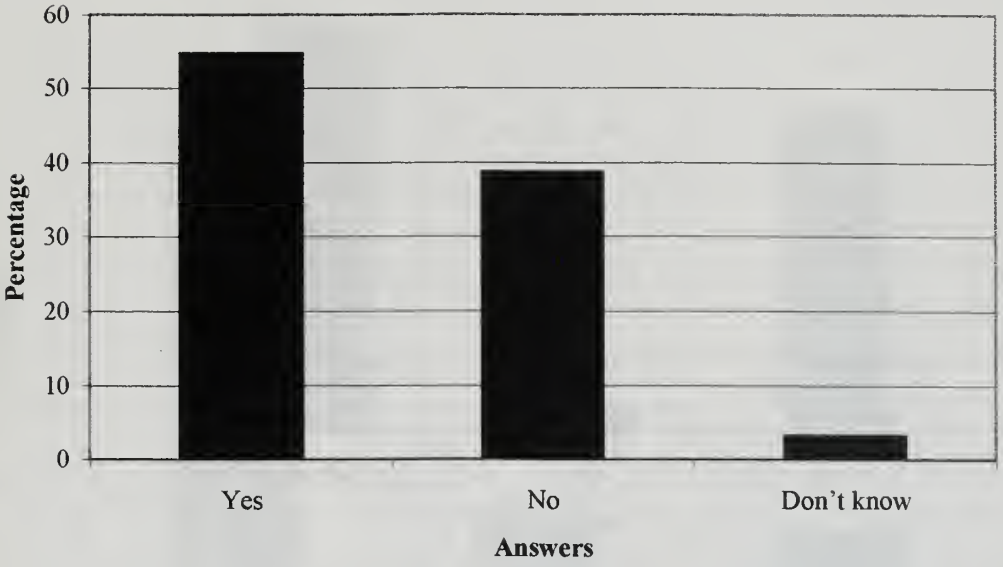

Figure 13. Statistical Findings of Questionnaire Question Number 24.

17. Is your Video Teleconferencing equipment compliant with the H.320 or H.324 standard?

This is questionnaire question number 25. Again, only respondents that use videoconferencing answered this question. The findings of this question can be seen in Table 17. Figure 14 is a bar chart of the findings in Table 17.

Answers	Yes	No	Don't Know
Percentage	41.9	3.2	54.8

Table 17. Statistical Findings of Questionnaire Question Number 25.

The results of this question show that the respondents either understood what the standards were and how they affected their systems or they did not know much about the standards.

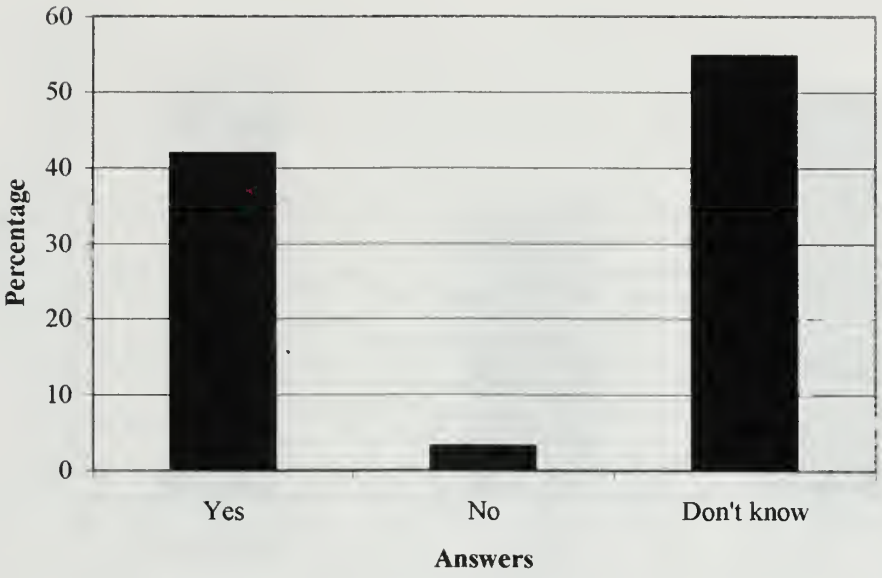

Figure 14. Statistical Findings of Questionnaire Question Number 25.

18. Is there someone at your command that could install the Video Teleconferencing software, video card, and Coder/Decoder (CODEC)?

This is questionnaire question number 26. The findings of this question can be seen in Table 18. Figure 15 is a bar chart of the findings in Table 18.

Answers	Yes	No	Don't Know
Percentage	73.1	14.9	11.9

Table 18. Statistical Findings of Questionnaire Question Number 26.

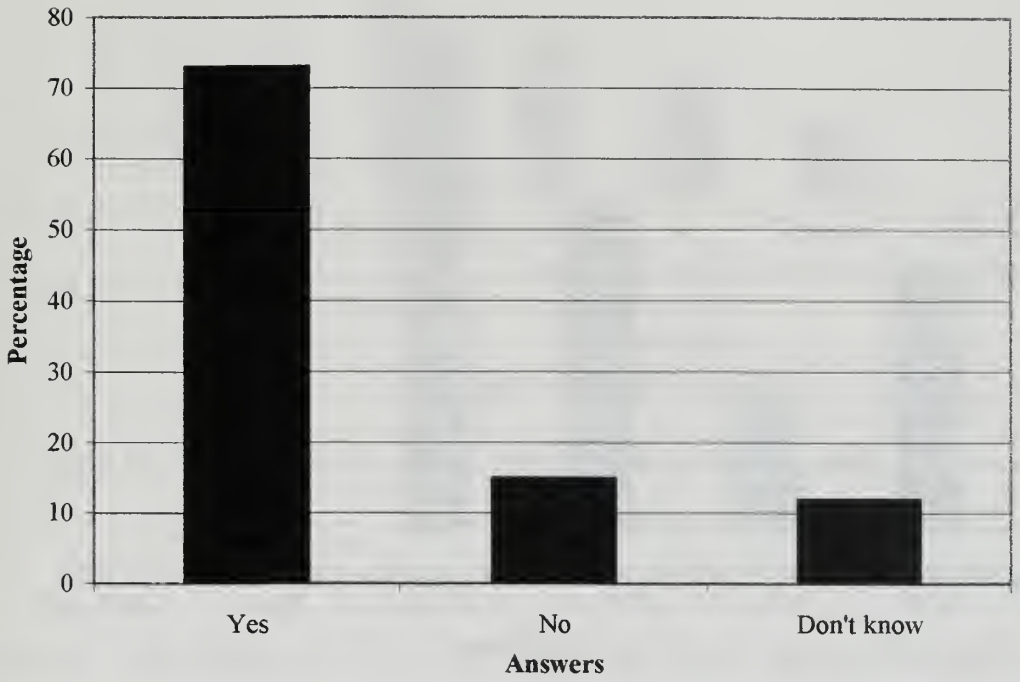

Figure 15. Statistical Findings of Questionnaire Question Number 26.

C. CONUS/OCONUS QUESTIONNAIRE RESULTS

To understand the questionnaires better, they were separated into CONUS commands and OCONUS commands. CONUS commands accounted for 86.6 percent of the returned questionnaires. OCONUS commands accounted for the remaining 13.4 percent. The result of reviewing both the CONUS and OCONUS questionnaire was that they were very consistent with the aforementioned questionnaire results. There were two areas, however, where there were significant differences. These differences came in the access to ISDN (questionnaire question number 17) and the existence of videoconferencing (questionnaire question number 21). CONUS commands were more likely to have access to ISDN. This can be seen in Figure 16.

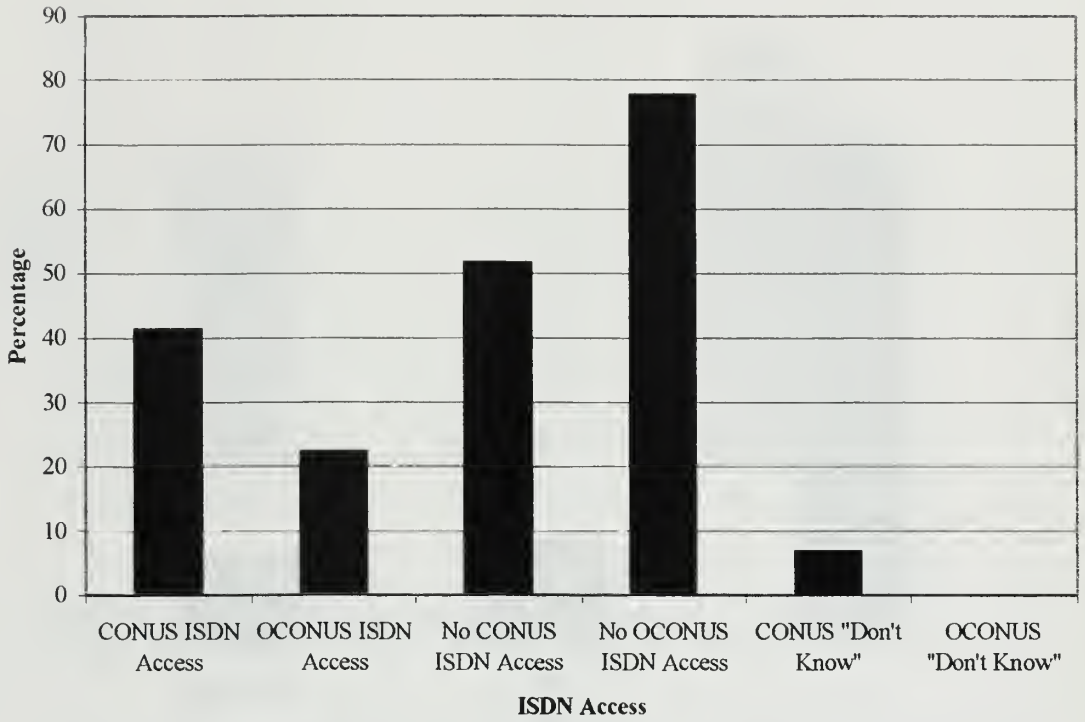

Figure 16. Comparison of CONUS vs. OCONUS ISDN Access.

OCONUS commands, however, stated that they were more likely to upgrade their phone lines to ISDN (questionnaire question number 18). This can be seen in Figure 17.

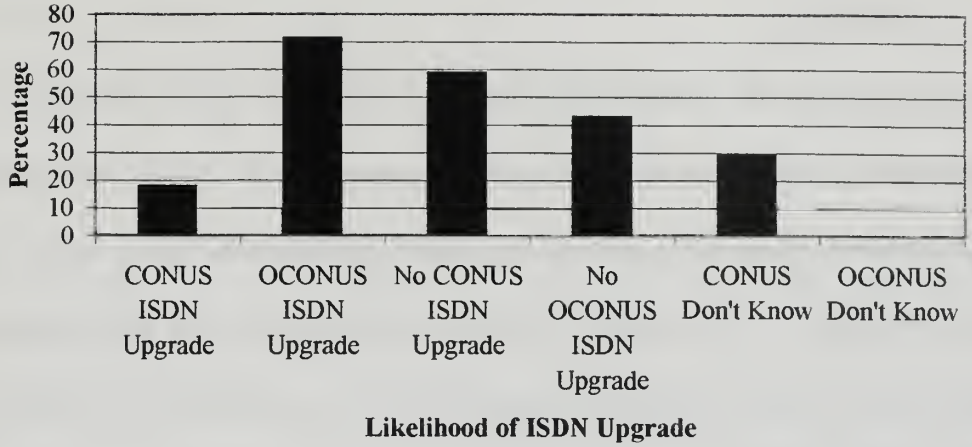

Figure 17. Comparison of CONUS and OCONUS ISDN Upgrade.

The other difference was the use of videoconferencing. CONUS commands were more likely to already have existing videoconferencing systems. This can be seen in Figure 18.

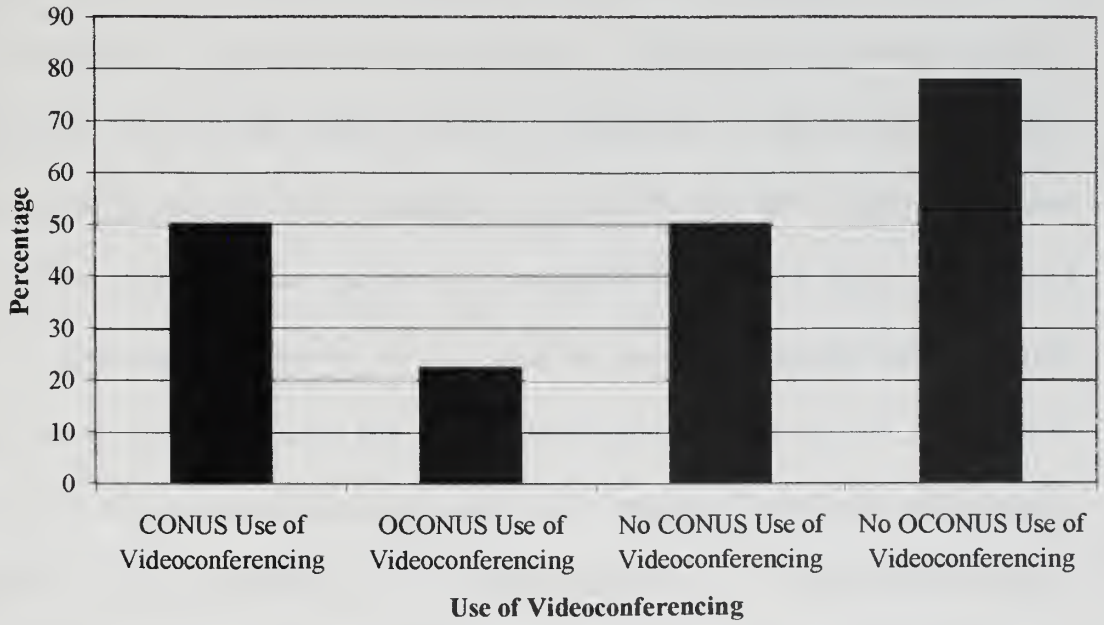

Figure 18. Comparison of CONUS and OCONUS use of Videoconferencing

D. ANALYSIS

Based on the results of this questionnaire, it appears feasible to utilize videoconferencing in the CWC Challenge Inspection process. Overall, the commands can support videoconferencing and most have the required phone lines to utilize videoconferencing. 38.8 percent of the respondents already use ISDN lines, and 26.8 percent of the remaining respondents stated that they were upgrading their phone lines to ISDN. Additionally, 46.3 percent of commands already use videoconferencing. These factors make the acquisition and use of an H.320 or H.324 standard compliant videoconferencing system feasible.

Desktop videoconferencing systems require the user to purchase kits and use special videoconferencing software. The most common software is CU-See-Me that was developed and copyrighted by Cornell University. It is free and is available for both Windows and Macintosh computers and supports both point-to-point and multipoint videoconferences over the Internet. In order to use this software, a minimum of a 28.8 KBPS modem is required. The results of the questionnaire showed that 61.2 percent of respondents possess this type of modem. Additionally, there is a commercial version of CU-See-Me called Enhanced CU-See-Me. There are Windows NT, Windows 95, Macintosh, and Power Macintosh versions. 77.6 percent of respondents are using Windows 95, 55.2 percent are using Windows NT, and some respondents listed using the Macintosh in the "Other" category. As far as processors are concerned, the minimum recommended processor is a 486DX2/66 MHz. The questionnaire results are that the respondents are using this type and faster processors. Additionally, 94 percent of

respondents have access to the Internet. These factors make desktop videoconferencing feasible. [Press, 1996, pp. 629-631]

This questionnaire also brought out other Information Technology initiatives that would be useful to IPO-5. These initiatives include recommendations on how to distribute the IRP, as well as an IPO-5 Website strategy. These specific recommendations will be discussed in Chapter V.

V. RECOMMENDATIONS AND CONCLUSION

A. VIDEOCONFERENCING RECOMMENDATION

The results of the questionnaire show that many commands are currently utilizing videoconferencing. Because of this, IPO-5 should acquire a videoconferencing system for its Headquarters Treaty Operations Center (HTOC) and make effective utilization of existing videoconferencing capabilities at these commands. This would make communication more effective between the affected base and the HTOC. For this type of videoconferencing, the author recommends the purchase of an H.324 standard compliant videoconferencing system. The benefits of the H.324 standard compliant system are that it communicates over POTS, is capable of videoconferencing with the H.320 standard compliant systems, and utilizes document sharing and editing. This type of system would best complement the existing Treaty Information Management System (TIMS).

For the commands that do not have videoconferencing, the author recommends that IPO-5 again use an H.324 standard compliant system. This system would go out with the Tiger Team and be set up on-site. This would again require the purchase of a desktop PC, but this is cheaper than purchasing the mobile teleconferencing system. Additionally, this type of system does not limit IPO-5 to using only ISDN phone lines like the mobile system does. This makes this type of system useful wherever the Challenge Inspection

may occur. As the videoconferencing industry evolves, there is the potential that an H.324 standard compliant mobile system may be available, but until then this is the best route.

The use of videoconferencing will require some adjustment to the current process as well as modifying the IRP to reflect the use of videoconferencing. The author believes that the use of this powerful communication medium far outweigh the change issues that will result from using this new tool. The recommendations from this section can be seen in Table 19.

VIDEOCONFERNCING RECOMMENDATIONS
• Purchase an H.324 standard compliant videoconferencing system for use at the HTOC, OSIA, and to communicate with commands with existing H.320 standard compliant videoconferencing systems.
• Purchase an H.324 standard compliant videoconferencing system to use at commands that do not have videoconferencing.

Table 19. Videoconferencing Recommendations

B. INSPECTION READINESS PLAN RECOMMENDATION

As stated before, the Inspection Readiness Plan is a very thorough document. It is currently contained in a 3-ring binder that is to be mass produced in its current form and mailed to the commands on IPO-5's list. As 95.5 percent of questionnaire respondents currently have CD-ROM capability, the author recommends that the contents of the IRP be placed on CD-ROM and mailed to the commands on the list. Additionally, the author recommends that the CD-ROMs be text only as this would ensure that the commands

receiving the CD-ROMs would be able to read them. This would reduce IPO-5's mailing costs as well as significantly reducing the paper and the binders required to undertake this endeavor.

The author also recommends that IPO-5 review their list of CWC Facilities without tenants. 10.8 percent of the questionnaires that were mailed using this list were returned. Many bases have closed due to the downsizing, and a review of this list is required to reduce the mailing costs of distributing the IRP.

One of the author's concerns was that the IRP would be misplaced due to the infrequent nature of the CWC Challenge Inspection. IPO-5 does not have a plan in the event that this happens. A response to this contingency is to use the IPO-5 Internet homepage and place the contents of the IRP in ZIP format on the homepage. This would simplify updates, and the affected commands can download them from the homepage at any time. As most of the questionnaire respondents have a Pentium processor, access to a 28.8 KBPS modem modem or better, and Internet access, downloading this document via the homepage would take time, but it would be cheaper than having to send the IRP via overnight mail or attempting to fax it. The recommendations from this section can be seen in Table 20.

INSPECTION READINESS PLAN RECOMMENDATIONS
• Place a text-only copy of the IRP on CD-ROMs and mail out to the commands on the IPO-5 list.
• IPO-5 needs to review their list of commands likely to be subject to a CWC Challenge Inspection.
• Place the IRP on the IPO-5 homepage in ZIP format.

Table 20. Inspection Readiness Plan Recommendations

C. TIGER TEAM RECOMMENDATION

The tiger team has many functions and will greatly assist any command having to undergo a CWC Challenge Inspection. Inside of CONUS, the tiger team will have no trouble getting out to a command and assisting in the preparatory functions. OCONUS, however is a different story. As the United States is a tenant at a host country facility, it is neither present for nor has an input to the perimeter negotiations as another nation state is being challenged. Additionally, the Tiger Team must get the requisite overseas paperwork in order to travel to an OCONUS facility. This could cause delays or prevent their timely arrival at an OCONUS facility.

The most important part of CWC Challenge Inspection preparatory activities are the base preparation and the base escort briefing. These two functions could be handled without the Tiger Team if the information is conveyed correctly. The author recommends that an instruction be written covering the detailed aspects of both base preparation and escorting. This instruction can be placed on the IPO-5 homepage for easy download. The IRP describes these functions, but there is more information that could be conveyed. Additionally, the IRP is set up with Tiger Team members being present during the Challenge Inspection. I also recommend using videoconferencing if that option is available. There were only 22.2 percent of the OCONUS questionnaire respondents who are using videoconferencing, but in these instances, videoconferencing training briefs could be held outlining the duties and responsibilities of the personnel conducting base escort duties and base preparation. The recommendations from this section can be seen in Table 21.

TIGER TEAM RECOMMENDATIONS
• Write a detailed instruction outlining the detailed aspects of base preparation and escorting.
• Place the instruction on the IPO-5 homepage for easy download.
• Utilize videoconferencing for base preparation and escorting training briefs if available.

Table 21. Tiger Team Recommendations

D. IPO-5 INTERNET HOMEPAGE RECOMMENDATION

The IPO-5 Internet homepage was developed to increase the Navy and Marine Corps' awareness of the Open Skies Treaty, the CWC, and to inform them about the purpose of IPO-5. This is a great tool to inform both the public and the naval services about IPO-5. In order for everyone to be able to access the homepage, commands must be utilizing an Internet web browser. According to the results of the questionnaire, the most common type of browsers being used by naval facilities are Netscape Navigator 3.0 and Microsoft Internet Explorer 3.0. The author recommends, however, that the IPO-5 homepage not use frames so the commands using Netscape Navigator 2.0 and Microsoft Internet Explorer 2.0 will be able to read and download information off of the homepage. There should also be a note on the bottom of the homepage that states for what browsers the homepage is optimized. The recommendations from this section can be seen in Table 22.

IPO-5 HOMEPAGE RECOMMENDATION
• Do not utilize frames on the homepage.
• Ensure that the homepage can be read using the older Netscape and Microsoft web browsers.

Table 22. IPO-5 Homepage Recommendations

E. CONCLUSION

The intent of this thesis was to recommend Information Technology initiatives that would help improve the CWC Challenge Inspection process. The biggest improvement that was suggested was the use of videoconferencing. This thesis focused on that one initiative. The results of the questionnaire, however, brought out other initiatives that could also be included in the CWC Challenge Inspection process.

In summary, this thesis looked at the entire CWC Challenge Inspection process as well as the documents that have been produced because of this treaty. The hardest part of this thesis was to find ways to improve an excellent plan. The IRP is an excellent document, and if followed, will help guide the challenged command through a very tense period. This thesis did, however, accomplish its goal of finding several Information Technology initiatives that would help to improve the IRP and the CWC Challenge Inspection process.

APPENDIX A. COMPUTER INFRASTURCURE QUESTIONNAIRE

1. Command Name _____

2. Name_____(Optional)

3. Job Title_____(Optional)

4. Rank_____(Optional)

5. Phone number_____(Optional)

6. E-mail Address_____(Optional)

7. Which of the following computer processors are at your command?

_____ 286, 386, or 486
_____ Pentium 75 MHz
_____ Pentium 100 MHz
_____ Pentium 133 MHz
_____ Pentium 166 MHz
_____ Pentium 200 MHz
_____ All of the above
_____ None of the above

8. Do your computers have CD-ROM?

_____ Yes
_____ No (If you answered No, proceed to question 10)
_____ Don't know

9. Are your CD-ROMs multimedia or text only?

_____ Yes
_____ No
_____ Don't know

10. What type, or types, of modems do you have at your command (Check all that apply)?

_____ 14.4 KBPS
_____ 28.8 KBPS
_____ 33.6 KBPS
_____ 56 KBPS
_____ All of the above
_____ None of the above

11. What type, or types, of operating system are your computers using (Check all that apply)?

_____ Windows 3.1
_____ Windows 95
_____ Windows NT
_____ UNIX
_____ DOS (Write in version number if known_____)
_____ Other (_____)
_____ Don't know

12. Does your command have access to the Internet?

_____ Yes
_____ No (If you answered No, proceed to question 14)
_____ Don't know

13. What type of Internet connection does your command have?

_____ Dial up
_____ SIPRNET
_____ T1
_____ None of the above
_____ All of the above
_____ Other (_____)
_____ Don't know

14. Does your command have access to Global Command and Control System (GCCS)?

_____ Yes
_____ No
_____ Don't know

15. Do you have a browser to navigate the Internet or GCCS?

_____ Yes
_____ No (If you answered No, proceed to question 17)
_____ Don't know

16. What browser and version number does your command use?

_____ Netscape Navigator 2.0
_____ Netscape Navigator 3.0
_____ Microsoft Internet Explorer 2.0
_____ Microsoft Internet Explorer 3.0
_____ Other (_____)
_____ Don't know

17. Does your command have Integrated Services Digital Network (ISDN) phone line access?

_____ Yes (If you answered Yes, proceed to question 20)
_____ No
_____ Don't know

18. Does your command plan to upgrade your existing phone line up to ISDN?

_____ Yes
_____ No (If you answered No, proceed to question 20)
_____ Don't know

19. What is the expected timeframe for the upgrade?

_____ Less than 6 months
_____ 6 months - 1 year
_____ 1 year - 2 years
_____ Greater than 2 years
_____ Don't know

20. Is there someone at your command that is knowledgeable about ISDN?

_____ Yes
_____ No
_____ Don't know

21. Does your command currently use Video Teleconferencing?

_____ Yes
_____ No (If you answered No, proceed to question 26)
_____ Don't know

22. Do you use Video Teleconferencing via the Internet?

_____ Yes
_____ No
_____ Don't know

23. Do you have a separate room dedicated to Video Teleconferencing?

_____ Yes
_____ No
_____ Don't know

24. Do you conduct training with your Video Teleconferencing system?

_____ Yes
_____ No
_____ Don't know

25. Is your Video Teleconferencing equipment compliant with the H.320 or H.324 standard?

_____ Yes
_____ No
_____ Don't know

26. Is there someone at your command that could install the Video Teleconferencing software, video card, and Coder/Decoder (CODEC)?

_____ Yes
_____ No
_____ Don't know

Thank you for participating in this questionnaire. Your answers will help the initiatives that are pending in support of the Navy Arms Control office. To return the questionnaire, just place it in the enclosed pre-addressed stamped envelope. Again, thank you for your time and participation in this questionnaire.

APPENDIX B. T.120 STANDARDS

Recommendation	Description	ITU Status (as of Oct. 96)
T.120	Data protocols for multimedia conferencing: This provides an overview of the T.120 series	Ratified
T.121	Generic Application Template: This provides a guide for development of T.120 application protocols	Ratified
T.122	Multipoint Communication Service (MCS) Description: This describes the multi-port services available to developers	Ratified
T.123	Protocol stacks for audiographic and audiovisual teleconference applications: This specifies transport protocols for a range of networks	Ratified
T.124	Generic Conference Control (GCC): This defines the application protocol supporting reservations and basic conference control services for multipoint teleconferences.	Ratified
T.125	Multipoint Communication Service (MCS) Protocol specification: This specifies the data transmission protocol for multipoint services	Ratified
T.126	Multipoint still image and annotation protocol: This defines collaborative data sharing, including white board; image sharing, graphic display information, and image exchange in a	Ratified

	multipoint conference.	
T.127	Multipoint Binary File Transfer Protocol: This defines a method for applications to transmit files in a multipoint conference	Ratified
T.130	Real time architecture for multimedia conferencing: Provides an over view description of how T.120 data conferencing works in conjunction with H.320 videoconferencing	Draft
T.131	Network-specific mappings: Defines how real time audio and video streams should be transported across different networks (i.e. ISDN, LAN, ATM) when used in conjunction with T.120 data conferencing	
T.132	Real time link management: Defines how real time audio and video streams may be created and routed between various multimedia conferencing endpoints	
T.133	Audio visual control services: Defines how to control the source and link devices associated with real time information streams	
T.RES	Reservation Services: This is an overview document which specifies how terminals, Multipoint Control Units, and reservation systems need to interact, and defines the interfaces between each of these elements	
T.Share	Application Sharing Protocol: This defines how participants in a T.120 conference can share local	Draft

	application such that other conference participants can see the image of the shared application, and use the mouse and keyboard to take control of the shared application as if it were running locally	
T.TUD	User Reservation: This describes how to transport a user-defined bitstream between various endpoints in a T.120 data conference	

[IMTC, T.120, 1997, pp. 2-5]

APPENDIX C. H.320 Standards

Standard/ Recommendation	Description	Status as of October 1996
H.320	H.320 is an "umbrella standard that covers audio, video, videoconferencing, graphics and multipoint	Ratified
H.221	Frame Structure for a 64 to 1920 KBPS channel in audiovisual teleservices	Ratified
H.230	Frame-synchronous Control and Indication Signals for Audiovisual systems	Ratified
H.242	System for establishing communication between terminals using digital channels up to 2 MBPS	Ratified
H.261	Video Codecs for audiovisual services at Px64 KBPS	Ratified
H.263	Specifies a new video codec for video over POTS	Ratified
H.231	Multipoint control unit for audiovisual systems using digital channels up to 2 MBPS	Ratified
H.243	System for establishing communication between three or more audiovisual terminals using digital channels up to 2 MBPS	Ratified
G.711	Pulse code modulations (PCM) of voice frequencies	Ratified
G.722	7 kHz audio-coding within 64 KBPS	Ratified
G.728	Coding of speech at 16 KBPS using low-delay code exciter linear prediction	Ratified
T.120	Data protocols for multimedia conferencing	Ratified

[IMTC, H.320, 1997, p.2-3]

APPENDIX D. H.323 STANDARDS

Recommendation	Description	Status as of October 1996
H.323	Address video (audiovisual) communication on Local Area Networks (LAN)	Ratified
H.225	Specifies messages for call control including signaling, registration and admissions, and packetization/ synchronization of media streams	Ratified
H.245	Specifies messages for opening and closing channels for media streams, and other commands, requests and indications	Ratified
H.261	Video codec for audiovisual services at Px64 KBPS	Ratified
H.263	Specifies a new codec for video over POTS	Ratified
G.711	Audio codec, 3.1 kHz at 48, 56, and 64 KBPS	Ratified
G.722	Audio codec, 7 kHz at 48, 56 and 64 KBPS	Ratified
G.728	Audio codec 3.1 kHz at 16 KBPS	Ratified
G.723	Audio codec, for 5.3 and 6.3 KBPS modes	Ratified
G.729	Audio codec	Ratified
T.120	Data protocols for multimedia conferencing	Ratified

[ITMC, H.323, 1997, pp.2-3]

APPENDIX E. H.324 Standards

Recommendation	Description	Status as of October 1996
H.324	Defines a multimedia communication terminal operating over the Switched Telephone Network.	Ratified
H.261	Video codec for audiovisual services at Px64 KBPS.	Ratified
H.263	Specifies a new video codec for video over POTS.	Ratified
H.223	Defines a multiplexing protocol for low bitrate multimedia terminals.	Ratified
H.245	Defines control of communications between multimedia terminals	Ratified
G.723	Defines speech coding for multimedia telecommunications transmitting at 5.3/6.3 KBPS	Ratified
T.120	Data protocols for multimedia conferencing	Ratified

[IMTC, H.324, 1997, p.3]

APPENDIX F. COMMANDS TO WHICH THE QUESTIONNAIRE WAS MAILED

CWC FACILITY DATABASE WITHOUT TENANTS

FACILITY NAME	CITY	STATE
CRITICAL		
MARINE CORPS AIR STATION	YUMA	AZ
NAVAL AIR WEAPONS STATION	POINT MUGU	CA
NAVAL COMMAND CONTROL & OCEAN SURVEILLANCE CTR RDTE DIVISION	SAN DIEGO	CA
NAVAL AIR WEAPONS STATION CHINA LAKE	CHINA LAKE	CA
NAVAL UNDERSEA WARFARE CTR DET	NEW LONDON	CT
NAVAL RESEARCH LABORATORY	WASHINGTON	DC
NAVAL SUBMARINE BASE	KINGS BAY	GA
NAVAL SURFACE WARFARE CENTER DIVISION	CRANE	IN
NAVAL SURFACE WARFARE CENTER CARDEROCK DIVISION	BETHESDA	MD
INDIAN HEAD DIVISION NAVAL SURFACE WARFARE CENTER	INDIAN HEAD	MD
NAVAL AIR STATION	PATUXENT RIVER	MD
MARINE CORPS AIR STATION	CHERRY POINT	NC
NAVAL UNDERSEA WARFARE CENTER DIVISION	NEWPORT	RI
NAVAL SURFACE WARFARE CENTER DAHLGREN DIVISION	DAHLGREN	VA
FLEET COMBAT TRAINING CTR ATLANTIC	VIRGINA BEACH	VA
NAVAL SUBMARINE BASE BANGOR	SILVERDALE	WA
HIGH PRIORITY		
NAVAL AIR STATION	ALAMEDA	CA
NAVAL WEAPONS STATION CONCORD	CONCORD	CA

NAVAL STATION	LONG BEACH	CA
LONG BEACH NAVAL SHIPYARD	LONG BEACH	CA
MARINE CORPS BASE	CAMP PENDLETON	CA
MARINE CORPS AIR GROUND COMBAT CENTER	TWENTYNINE PALMS	CA
NAVAL AMPHIBIOUS BASE CORONADO	CORONODO	CA
MARE ISLAND NAVAL SHIPYARD	MARE ISLAND	CA
NAVAL AIR STATION NORTH ISLAND	CORONADO	CA
NAVAL SUBMARINE BASE NEW LONDON	GROTON	CT
NAVAL DISTRICT WASHINGTON	WASHINGTON	DC
NAVAL SECURITY STATION	WASHINGTON	DC
NAVAL AIR STATION CECIL FIELD	CECIL FIELD	FL
NAVAL AIR STATION	JACKSONVILLE	FL
NAVAL TRAINING CENTER	ORLANDO	FL
NAVAL SURFACE WARFARE CENTER COASTAL SYSTEM STA DAHLGREN DIV	PANAMA CITY	FL
NAVAL AIR STATION PENSACOLA	PENSACOLA	FL
NAVAL STATION	PEARL HARBOR	HI
NAVAL COMMUNICATION & TELECOMMUNICATIONS AREA MASTER	WAHIAWA	HI
NAVAL AIR STATION	BARBERS POINT	HI
NAVAL MAGAZINE LUALUALEI	WAIANEAE	HI
FLEET AND INDUSTRIAL SUPPLY CENTER	PEARL HARBOR	HI
MARINE CORPS BASE HAWAII	CAMP H. M. SMITH	HI
PEARL HARBOR NAVAL SHIPYARD	PEARL HARBOR	HI
PUBLIC WORKS CENTER	PEARL HARBOR	HI
NAVAL SURFACE WARFARE CTR ORDNANCE STA	LOUISVILLE	KY
NAVAL EXPLOSIVE ORDNANCE DISPOSAL TECHNOLOGY DIV	INDIAN HEAD	MD

NAVAL AIR STATION	BRUNSWICK	ME
NAVAL STATION PASCAGOULA	PASCAGOULA	MS
PORTSMOUTH NAVAL SHIPYARD	PORTSMOUTH	NH
NAVAL WEAPONS STATION EARLE	COLTS NECK	NJ
NAVAL AIR ENGINEERING STATION	LAKEHURST	NJ
NAVAL AIR WARFARE CENTER WEAPONS DIVISION DETACHMENT	WHITE SANDS MISSILE RANGE	NM
NAVAL AIR WEAPONS CENTER AIRCRAFT DIVISION	WARMINSTER	PA
PHILADELPHI NAVAL SHIPYARD	PHILADELPHIAPA	
NAVAL BASE	PHILADELPHIAPA	
CHARLESTON NAVAL SHIPYARD	CHARLESTON	SC
NAVAL BASE	CHARLESTON	SC
NAVAL WEAPONS STATION CHARLESTON	GOOSE CREEK	SC
NAVAL STATION	CHARLESTON	SC
NAVAL BASE NORFOLK	NORFOLK	VA
NORFOLK NAVAL SHIPYARD	PORTSMOUTH	VA
NAVAL WEAPONS STATION YORKTOWN	YORKTOWN	VA
NAVAL AMPHIBIOUS BASE LITTLE CREEK	NORFOLK	VA
NAVAL STATION	NORFOLK	VA
NAVAL AIR STATION	NORFOLK	VA
MARINE CORPS COMBAT DEVELOPMENT COMMAND	QUANTICO	VA
NAVAL ORDNANCE CENTER PACIFIC DIVISION	PORT HADLOCK	WA
NAVAL UNDERSEA WARFARE CENTER DIVISION KEYPORT	KEYPORT	WA
PUGET SOUND NAVAL SHIPYARD	BREMERTON	WA

OCONUS

NAVAL UNDERSEA WARFARE CTR DET ANDROS ISLAND BAHAMAS	FPO	AA
NAVAL SECURITY GROUP ACTIVITY SABANA SECU	FPO	AA

PUERTO RICO		
US NAVAL STATION ROOSEVELT ROADS PR	FPO	AA
NAVAL STATION GUANTANAMO BAY CU	FPO	AE
NAVAL AIR STATION KELAVIK ICELAND	FPO	AE
US NAVAL AIR STATION SIGONELLA ITALY	FPO	AE
US NAVAL AIR STATION BERMUDA	FPO	AE
US NAVAL FACILITY ARGENTIA NEWFOUNDLAND CANADA	FPO	AE
US NAVAL SUPPORT ACTIVITY SOUDA BAY CRETE GREECE	FPO	AE
NAVAL SUPPORT ACTIVITY NAPLES ITALY	FPO	AE
US NAVY SUPPORT ACTIVITY LA MADDALENA ITALY	FPO	AE
US NAF MILDENHALL UK	FPO	AE
US NAVAL STATION ROTA SPAIN	FPO	AE
US NAVAL FACILITY BRAWDY UK	FPO	AE
US NAVAL ACTIVITIES LONDON UK	FPO	AE
NAVAL AIR FACILITY ADAK ALASKA	FPO	AP
US NAVAL SUPPORT FACILITY DIEGO GARCIA	FPO	AP
NAVAL COMPUTER & TELECOMMUNICATIONS AREA MASTER STATION GUAM	FPO	AP
US NAVAL AIR STATION AGANA GUAM	FPO	AP
US NAVAL AIR FACILITY ATSUGI JAPAN	FPO	AP
FLEET ACTIVITIES SASEBO JAPAN	FPO	AP
FLEET ACTIVITIES YOKOSUKA JAPAN	FPO	AP
NAVAL AIR FACLITIY MIDWAY ISLAND	FPO	AP
OTHER		
NATIONAL BIODYNAMICS LABORATORY	NEW ORLEANS	LA
RESERVE CENTERS		
NAVAL RESERVE CENTER	ANCHORAGE	AK

NAVAL & MARINE CORPS RESERVE CENTER	SAN JOSE	CA
NAVAL HOSPITAL	ORLANDO	FL
NAVAL RESERVE CENTER	DUBUQUE	IA
NAVAL RESERVE CENTER	FOREST PARK	IL
NAVAL & MARINE CORPS RESERVE CENTER	FORT WAYNE	IN
NAVAL RESERVE CENTER	WICHITA	KS
NAVAL AIR RESERVE CENTER	INDUSTRIAL AIRPORT	KS
NAVAL & MARINE CORPS RESERVE CENTER	LAWRENCE	MA
NAVAL RESERVE CENTER	AUGUSTA	ME
NAVAL & MARINE CORPS RESERVE CENTER	BATTLE CREEK	MI
ARMED FORCES RESERVE TRAINING CENTER	SAGINAW	MI
NAVAL RESERVE CENTER	CADILLAC	MI
NAVAL & MARINE CORPS RESERVE CENTER	BILLINGS	MT
NAVAL RESERVE CENTER	LINCOLN	NE
READINESS COMMAND REGION 2 SCOTIA NY	SCOTIA	NY
BRATENAHL ANNEX	CLEVELAND	OH
MARINE CORPS RECRUITING DEPOT	PARRIS ISLAND	SC
NAVAL RESERVE CENTER NASHVILLE TN	NASHVILLE	TN
NAVAL RESERVE CENTER LA CROSSE	LA CROSSE	WI
NAVAL & MARINE CORPS RESERVE CENTER	GREEN BAY	WI

ROUTINE

NAVAL SECURITY GROUP ACTIVITY	ANCHORAGE	AK
WESTERN DIVISION NAVAL FACILITIES ENGR COMMAND	SAN BRUNO	CA
NAVAL AIR FACILITY	EL CENTRO	CA
NAVAL AIR STATION LEMOORE	LEMOORE	CA
NAVAL POSTGRADUATE SCHOOL	MONTEREY	CA
NAVAL CONSTRUCTION BATTALION CENTER	PORT HUENEME	CA

NAVAL COMMAND CONTROL & OCEAN SURVEILLANCE CTR ISE WEST DIVISION	SAN DIEGO	CA
NAVAL TRAINING CENTER	SAN DIEGO	CA
NAVAL STATION	SAN DIEGO	CA
SOUTHWEST DIVISION NAVAL FACILITIES ENGINEERING COMMAND	SAN DIEGO	CA
NAVAL STATION TREASURE ISLAND	SAN FRANCISCO	CA
NAVAL COMMUNICATION STATION	STOCKTON	CA
FLEET COMBAT TRAINING CENTER PACIFIC	SAN DIEGO	CA
NAVAL STATION ANACOSTIA	WASHINGTON	DC
NAVAL COMPUTER & TELECOMMUNICATION STATION	WASHINGTON	DC
OFFICE OF NAVAL INTELLIGENCE SUITLAND	WASHINGTON	DC
FLEET & INDUSTRIAL SUPPLY CENTER	JACKSONVILLE	FL
NAVAL STATION MAYPORT	MAYPORT	FL
NAVAL SCHOOL EXPLOSIVE ORDNANCE DISPOSAL DET	EGLIN AFB	FL
NAVAL AIR STATION ATLANTA	MARIETTA	GA
CAMP H. M. SMITH US MARINE CORPS	CAMP H.M. SMITH	HI
NAVAL SURFACE WARFARE CENTER CARDEROCK DIVISION DETACHMENT	BAYVIEW	ID
NAVAL TRAINING CENTER	GREAT LAKES	IL
NAVAL SUPPORT ACTIVITY	NEW ORLEANS	LA
NAVAL AIR STATION	SOUTH WEYMOUTH	MA
NATIONAL NAVAL MEDICAL CENTER	BETHESDA	MD
NAVAL SURFACE WARFARE CENTER CARDEROCK DIVISION	ANNAPOLIS	MD
NAVAL SATELLITE OPERATIONS CENTER DET ALPHA	PROSPECT HARBOR	ME
NAVAL SATELLITE OPERATIONS CENTER DET BRAVO	ROSEMOUNT	MN
NAVAL CONSTRUCTION BATTALION CENTER	GULFPORT	MS
MARINE CORPS AIR STATION NEW RIVER	JACKSONVILLE	NC

NAVAL AIR WARFARE CENTER WEAPONS DIV DET	ALBUQUERQUE	NM
NAVAL NUCLEAR POWER TRAINING UNIT	BALLSTON SPA	NY
NAVAL AIR STATION WILLOW GROVE	WILLOW GROVE	PA
MARINE CORPS AIR STATION BEAUFORT	BEAUFORT	SC
NAVAL AIR STATION MEMPHIS	MILLINGTON	TN
NAVAL AIR STATION	DALLAS	TX
NAVAL STATION INGLESIDE	INGLESIDE	TX
NAVAL AIR STATION OCEANA	VIRGINIA BEACH	VA
FLEET & INDUSTRIAL SUPPLY CTR NORFOLK	WILLIAMSBURG	VA
NAVAL STATION EVERETT	EVERETT	WA
NAVAL RADIO STATION JIM CREEK	ARLINGTON	WA
SUPSHIP NEW ORLEANS DET STURGEON BAY	STURGEON BAY	WI

APPENDIX F. QUESTIONNAIRE RESPONDENTS

CWC FACILITY DATABASE WITHOUT TENANTS RESPONDENTS

FACILITY NAME	CITY	STATE
CRITICAL		
NAVAL AIR WEAPONS STATION	CHINA LAKE	CA
NAVAL RESEARCH LABORATORY	WASHINGTON	DC
NAVAL SUBMARINE BASE	KINGS BAY	GA
NAVAL SURFACE WARFARE CENTER CARDEROCK DIVISION	BETHESDA	MD
INDIAN HEAD DIVISION NAVAL SURFACE WARFARE CENTER	INDIAN HEAD	MD
NAVAL UNDERSEA WARFARE CENTER DIVISION	NEWPORT	RI
NAVAL SURFACE WARFARE CENTER DAHLGREN DIVISION	DAHLGREN	VA
FLEET COMBAT TRAINING CTR ATLANTIC	VIRGINA BEACH	VA
HIGH PRIORITY		
NAVAL AIR STATION	ALAMEDA	CA
NAVAL WEAPONS STATION CONCORD	CONCORD	CA
NAVAL STATION **(RTS - Closed)***	LONG BEACH	CA
NAVAL AIR STATION CECIL FIELD	CECIL FIELD	FL
NAVAL TRAINING CENTER	ORLANDO	FL
NAVAL SURFACE WARFARE CENTER COASTAL SYSTEM STA DAHLGREN DIV	PANAMA CITY	FL
NAVAL AIR STATION PENSACOLA	PENSACOLA	FL
NAVAL AIR STATION	BARBERS POINT	HI
MARINE CORPS BASE HAWAII	CAMP H. M. SMITH	HI
PEARL HARBOR NAVAL SHIPYARD	PEARL HARBOR	HI
PUBLIC WORKS CENTER	PEARL HARBOR	HI
NAVAL SURFACE WARFARE CTR ORDNANCE STA	LOUISVILLE	KY

NAVAL EXPLOSIVE ORDNANCE DISPOSAL TECHNOLOGY DIV	INDIAN HEAD	MD
NAVAL AIR STATION	BRUNSWICK	ME
NAVAL STATION PASCAGOULA	PASCAGOULA	MS
NAVAL AIR ENGINEERING STATION	LAKEHURST	NJ
NAVAL AIR WARFARE CENTER WEAPONS DIVISION DETACHMENT	WHITE SANDS MISSILE RANGE	NM
NAVAL AIR WEAPONS CENTER AIRCRAFT DIVISION	WARMINSTER	PA
PHILADELPHI NAVAL SHIPYARD **(RTS)***	PHILADELPHIAPA	
NAVAL BASE **(RTS)***	PHILADELPHIAPA	
CHARLESTON NAVAL SHIPYARD **(RTS - Closed)***	CHARLESTON	SC
NAVAL BASE **(RTS - Closed)***	CHARLESTON	SC
NAVAL STATION **(RTS - Closed)***	CHARLESTON	SC
NAVAL BASE NORFOLK	NORFOLK	VA
MARINE CORPS COMBAT DEVELOPMENT COMMAND **(RTS)***	QUANTICO	VA
NAVAL ORDNANCE CENTER ATLANTIC	VIRGINIA BEACH	VA
NAVAL ORDNANCE CENTER PACIFIC DIVISION	PORT HADLOCK	WA

OCONUS

US NAVAL STATION ROOSEVELT ROADS PR	FPO	AA
NAVAL AIR STATION KELAVIK ICELAND	FPO	AE
US NAVAL AIR STATION SIGONELLA ITALY	FPO	AE
US NAVAL AIR STATION BERMUDA **(RTS - Closed)***	FPO	AE
US NAVAL FACILITY ARGENTIA NEWFOUNDLAND CANADA **(RTS -Closed)***	FPO	AE
US NAVAL SUPPORT ACTIVITY SOUDA BAY CRETE GREECE	FPO	AE
NAVAL SUPPORT ACTIVITY NAPLES ITALY	FPO	AE
US NAF MILDENHALL UK	FPO	AE

US NAVAL STATION ROTA SPAIN	FPO	AE
US NAVAL FACILITY BRAWDY UK **(RTS -Closed)***	FPO	AE
US NAVAL ACTIVITIES LONDON UK	FPO	AE
NAVAL COMPUTER & TELECOMMUNICATIONS AREA MASTER STATION GUAM	FPO	AP
US NAVAL AIR STATION AGANA GUAM **(RTS - Closed)***	FPO	AP
NAVAL AIR FACLITIY MIDWAY ISLAND **(RTS - Closed)***	FPO	AP
RESERVE CENTERS		
NAVAL RESERVE CENTER	ANCHORAGE	AK
NAVAL & MARINE CORPS RESERVE CENTER	SAN JOSE	CA
NAVAL HOSPITAL **(RTS - Closed)***	ORLANDO	FL
NAVAL RESERVE CENTER	DUBUQUE	IA
NAVAL & MARINE CORPS RESERVE CENTER	FORT WAYNE	IN
NAVAL RESERVE CENTER	WICHITA	KS
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